Age, Health, and Taste: Consumer Choice and Revealed Attitudes toward Characteristics of Dairy Products.

by

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Executive Summary

This study explores the relationship between the dimensions of consumer age, consumer attitudes about dietary fat and cholesterol, and taste perceptions which influence decisions to use alternative dairy products. Data used for analyses were taken from a set of repeated non-panel surveys administered in 1976, 1982 and 1988. Each survey represented a stratified random sample of over 3,500 consumers reporting on dairy product use and attitudes. The survey instrument was stratified by geographic region within the United States, respondents age, sex, and marital status. The survey instrument was highly consistent in the questions asked and the wording of each question over the sample time frame.

The Ordered Logistic Maximum Likelihood (OLML) procedure was employed to evaluate the effects of panel member age, annual household income, household size, racial background, and Likert scale variables regarding the consumers' attitudes toward a series of dairy products. These attitudes scales reflected positive and negative perceptions of dairy products. The positive attitudes reflected healthful product characteristics. The negative attitudes generally reflected dietary fat and cholesterol concerns. Additional Likert scale variables reflected the consumer's general taste preferences.

Health related variables are generally highly significant in determining the probability that a panel member will use or not use a given dairy product. Consumer age and taste variables also play an important role. The probability of use of the selected dairy products declines with age, or a negative taste image of the product. Health concerns about dietary fat and cholesterol, while exhibiting a negative influence on product use, do not appear as important in the decision process. While significant attention is focused on the affects of health attitudes, the more important issue facing the U.S. dairy industry is the ageing consumer population. This is especially true for the fluid products sectors. There is consistent evidence that the negative effects of age are not dimishing but possibly increasing over the study period. The same cannot be concluded for either the cheese products group nor the soft products of Ice cream, Ice milk, and Yogurt. The frequency of use of these products are not as sensitive to the age demographics of the consumer market as that of the fluid product. This helps to explain why per-capita fluid use is declining while per-capita use of hard and soft products has been increasing over the last two decades.

Introduction

Milk and dairy products play an important role in the diets of most consumers. These products make up one of the four basic food groups that every school boy or girl learns about beginning in the first grade. On a product pound basis the average American consumer used approximately 237 pounds of fluid milk, 4.2 pounds of butter, 23.6 pounds of cheese, 16.4 pounds of ice cream, and 8.1 pounds of ice milk in 1989. The per-capita utilization of milk, whether as fluid or as a manufactured dairy product has changed over the last twenty years Table 1.

Table 1. Dairy Products: Per capita consumption, United States, 1976-89.

	Fluid Milk	Butter	Cheese	Ice Cream	Ice Milk
1976	260	4.3	15.5	17.0	7.5
1977	257	4.3	17.0	17.7	7.7
1978	254	4.4	16.9	17.6	7.7
1979	251	4.5	16.8	17.3	7.3
1980	246	4.5	17.5	17.5	7.1
1981	242	4.2	18.2	17.4	7.0
1982	235	4.3	19.6	17.6	6.6
1983	235	4.9	20.5	18.0	6.9
1984	237	4.9	21.4	18.1	7.0
1985	240	4.9	22.4	18.1	6.9
1986	240	4.6	23.1	18.4	7.2
1987	237	4.6	23.9	18.3	7.4
1988	236	4.5	23.5	17.2	7.9
1989	237	4.2	23.6	16.4	8.1

United States Department of Agriculture: DS0 April 1990.

Per-capita use of butter has remained approximately constant, while cheese, ice cream, and ice milk use have climbed over the last decade. In fact, while the American consumer has shown a definite preference shift away from higher fat content fluid milk they have also increased the use of higher fat cheeses and creams. This changing composition of consumer use of dairy products has lead to an increased interest in the relationship between consumers attitudes toward health related issues and their perception of the health influencing characteristics of dairy products.

The shift in preference toward lowfat or skim milk appears to reflect the consumers awareness of diet related health issues. This is reflected as an interest in a lower fat or cholesterol lifestyle, yet the increased use of higher fat products such as cheese and ice cream is not entirely consistent with this assessment. Consumption of dairy products by households is a major component of total sales of the U.S. dairy sector. Understanding the factors which may influence household dairy product use is important to dairy farmers, milk processors and manufacturers. Consumers' responses to changes in price, income, and non-price factors are basic to a fundamental understanding of the future direction of household consumption patterns. Forecasting the future direction of household consumption, and how that direction might be modified through industry efforts or by national programs and policies, requires information on the influence of sociological, demographic, psychological, and economic variables on consumption.

Scope of Study and Source of Data

This study focuses on the interrelationship of consumer age, health perceptions and taste attitudes toward selected dairy product characteristics over the time period 1976, 1982 and 1988. These consumer panel surveys were developed by the United Dairy Industry Association and made available to the author for this analysis. Additional support was provided by the Milk Industry Foundation / International Association of Ice Cream Manufacturers. This research address these questions by carefully examining survey data wherein consumers report scale indices on health and taste attributes of dairy products to ascertain the relative affects of these variables in a manner consistent with an increased awareness of health issues and concerns. A set of repeated consumer surveys for 1976, 1982 and 1988, each survey containing over 3,600 sample observations form the basis for the analysis. This research paper focuses on consumer use of (i) any type of fluid milk, which includes whole, lowfat, skim and flavored fluid milk; (ii) non-cottage cheese (all types); (iii) ice cream (any type); (iv) ice milk (any type); and (v)

yogurt (any type). Consumer use of these products clearly reflects the issues involved in health concerns and shifts in consumption patterns.

Methodology

The economic theory of demand has evolved along a couple of lines of inquiry. Traditional demand theory postulates the existence of a utility function independent of the bundle of goods and the individuals resource endowment. The consumer maximizes his/her welfare by allocating this resource endowment across the goods bundle such that the utility function reaches a maximum value subject to the income available. From this basic setup, a number of demand concepts can be derived. The most important is the existence of a quantity dependent demand function. Changes in relative prices and/or income move the consumer from one point on the utility function to another. A key point is that the utility function is independent of prices and income and therefore remains unchanged in this process.

Likewise, price dependent functions can also be derived. The latter approach focuses on consumer goods characteristics models CGCM(Ladd). The individual consumer is assumed to maximize a utility function defined over a vector of micro-goods or characteristics. These micro-goods are generally not available in the market but must be purchased in the form of a composite good. For example, a consumer may desire the micro-goods refreshing taste, low fat content, low cholesterol content, nutritious food product, contemporary product image, , etc., for which direct markets do not exist. The consumer acquires these micro-goods in the form of the composite good, a specific dairy product. In fact the consumer will generally purchase a number of food commodities which in aggregate supply different amounts of each of these micro-goods. In selecting foods, the consumer is making decisions on total dietary nutrition, health, taste, convenience, image, etc..

Producers of products compete in the market by altering the actual or perceived level of micro-goods provided by the commodity in question. For example, by increasing the level of quality in a product, e.g., "new and improved", without altering the product price, producers can expect to change the level of product sales.

This leads to the idea that the demand for a commodity can be expressed as a function of the price of the product, other substitute/complement product prices, income, and the levels of characteristics or micro-goods embodied in the commodity. What is lacking is any indication of what these micro-goods might be. In traditional demand analysis we can observe through a

type of revealed preference just what commodities the consumer demands. This information is recorded in markets with public reporting of transactions. Identification of micro-goods is not as easy as simply observing market data. What micro-goods are being demanded for example in a basket of food items? Or a consumer's purchase of durables over a period of time?

Another issue which must be addressed is the role that sociological, psychological, and demographic variables (SPD) play in the demand function. It is clear that the CGCM incorporates the effects of such variables indirectly into the hedonic price or the commodity demand function. This is obvious by noting that the derivatives which form the basis for these functions follow uniquely from an assumed static consumer utility function.

Clearly the parameters of this utility function for an individual consumer are derived from the individual's sociological, psychological, and demographic makeup. Income is an operational variable allowing the consumer to take action on that utility function. Prices are choice or rationing variables forcing the consumer to allocate that income. But ultimately the consumer's desire to purchase a commodity in any amount is governed by the inherent underlying parameters of the respective utility function. Changes in consumer choice may come about because of a shift in this utility function, prices and income unchanged.

Another dimension to the theory of demand comes from the notion that consumers observed choices among alternatives derives from the maximization of a stochastic utility function (McFadden,1974). The primary difference between this concept and more traditional demand concepts is that consumers discrete choices are of interest and not the actual quantity purchased. How choice attributes or characteristics of the chooser influence the particular choice is the primary focus. Suppose that an individual faces m choices. There exists a latent variable Y^* which denotes the level of indirect utility associated with the i-th choice. The observed variables Y_i are defined as:

$$\begin{aligned} Y_i &= 1 && \text{if } Y_i^* = \text{Max}(Y_1^*, Y_2^*, \ldots, Y_m^*) \\ Y_i &= 0 && \text{otherwise} \end{aligned} \qquad (1)$$

If we write $Y_i = V_i(X_i) + \epsilon_i$, where X_i is the vector of attributes for the i-th choice and ϵ_i is a residual that captures unobserved variations in tastes and in the attributes of alternatives and errors in the perception and optimization by the consumer.

If the residuals ϵ_i are independent and identically distributed with the type I extreme-value distribution whose cumulative distribution function (CDF) is:

$$(2) \qquad F(\epsilon_i < \epsilon) = \exp(-e^{-\epsilon})$$

and whose probability density function (PDF) is:

$$(3) \qquad f(\epsilon_i) = \exp(-\epsilon_i - e^{-\epsilon})$$

then we can show that:

$$(4) \qquad \text{Prob}(Y_i \mid X_i) = \frac{e^{V_i}}{\sum_j^m e^{V_j}}$$

With this model of choice behavior we can estimate the probability that a given choice will be selected. If we have a set of N individuals faced with m choices, we can define:

Y^*_{ij} = the level of indirect utility for the t^{th} individual making the j^{th} choice

(5) $Y_{ij} = 1$ the tth individual makes the jth choice

$Y_{ij} = 0$ otherwise.

The probability of the ith consumer choosing to use the product is then given as:

$$(6) \qquad P_{ij} = \text{Prob}(Y = 1) = \frac{1}{1 + e^{\beta x_{ij}}}$$

and the influence of the j-th chooser specific variable on the probability or equivalently the frequency of product use is given by:

$$(7) \qquad \frac{\partial}{\partial X_{ij}} L(X_{ij}\beta) = f(X_i\beta)\beta_j$$

In these multinomial choice models the general specification is to allow each choice to be a function of both the attributes of the choices themselves and the chooser, where X_{tj} is the vector of values of the attributes of the j-th choice as perceived by the t-th individual and Z_t are individual-specific variables characterizing the chooser, then the probability of the t-th individual selecting the j-th choice is expressed as:

$$(8) \qquad P_{tj} = \text{Prob}(Y_{tj} = 1) = \frac{e^{\beta' x_{tj} + \alpha_j' z_t}}{\sum_{k-1}^{m} e^{\beta' x_{tj} + \alpha_k' z_t}}$$

An extension to this model which is used in this study is referred to as the "ordered logit maximum likelihood model" (OLML). The OLML model posits that the individual chooses in a hierarchical fashion (Maddala). For example, the choice will be made as to purchase or use a product or not, and then based on the outcome of this choice the individual will decide on what level or how much of the good to purchase or use. The level of choice follows an underlying "ordering" from "no" product use to "light use", to "moderate use" and then to "heavy use".

For example, suppose that there are four ordered categories of product use. Category one is no use, category two is light use, category three is moderate use, and category four is heavy use. In this case we define the OLML model as follows. There is an unobserved variable Y_i which measures actual product use. There is an observed variable Z_i which is ordinal in scale and which has M possible outcomes: 1,2,.....,M. Z_i is related to Y_i by a set of thresholds $\alpha_0 = -\text{inf} < \alpha_1 < \ldots\ldots < \alpha_{M-1} < \alpha_M = +\text{inf}$. The model implies the following probability ordering:

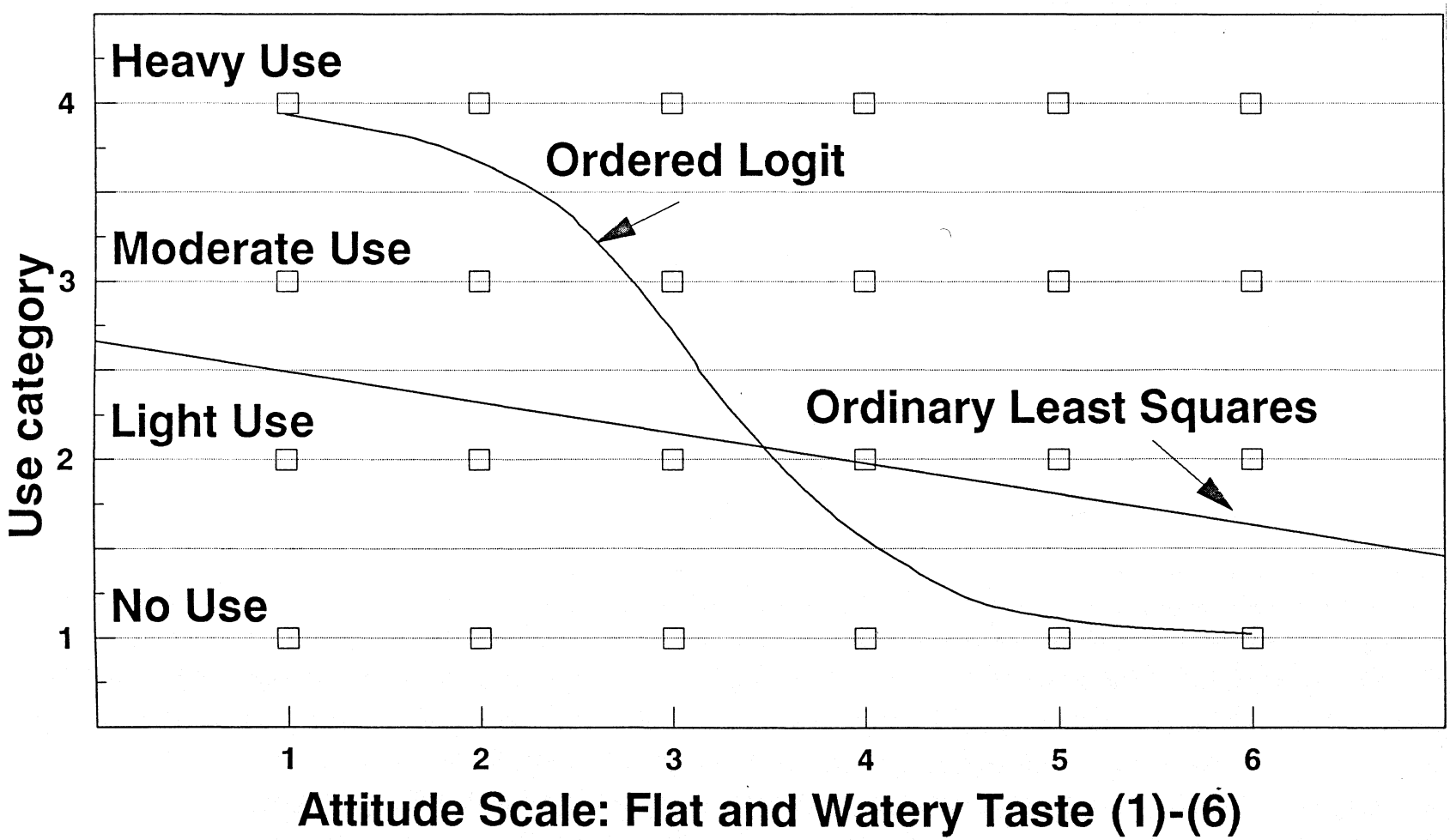
$$(9) \qquad \text{Prob}(y_i = m) = F(\alpha_m - x_i\beta) - F(\alpha_{m-1} - x_i\beta)$$

for m=1,2,....,M, where F is the cumulative logistic function.

An example of the use of the ordered logit model can be illustrated by the use of figure 1. This figure depicts a scatterplot of the frequency level of lowfat/skim milk (CFLS) on the vertical axis and the response to the statement (LFFW): Lowfat milk tastes flat and watery. The survey respondents answered by indicating a score from 1 - definitely disagree, to 6 - definitely agree, with the statement. A priori it would seem more reasonable that those respondents who indicate a 1 will be more likely to be in category 4 - heavy consumers of lowfat/skim milk than will those who indicate a score of 6 signaling a distaste for the product.

The heavy dark line in figure 1 bears this presumption out. This is a simple ordinary least squares regression line of LFFW on to CFLS. The negative slope indicates that the likelihood of heavy use declines with the respondents dislike for the taste of the product. The OLS line indicates a linear relationship between CFLS and LFFW which is not very accurate. The lighter line labeled Ordered Logit depicts the non-linear nature of the relationship between CFLS and LFFW. At low LFFW scores the likelihood or probability of a respondent being a heavy use,

Figure 1. Scatterplot of product use category vs. repondents attitude on product taste.



e.g., category 4, is very close to one. At high LFFW score levels the opposite is true. The Ordered Logit model will more nearly capture this relationship than will the OLS line. Notice that the OLS line understates the extent of the category 4 occurrences for low LFFW scores and overstates the occurrences of light or no use, i.e., category 2 or 1 for high LFFW scores. The Ordered Logit models developed and estimated in this study are simply extensions of this basic idea to models with more than one determining variable.

Data Characteristics

Data for this study were obtained from a stratified random sample survey which was conducted in 1976, 1982 and 1988. The sample observations include 3,636 panel members in 1976, 3,753 panel members in 1982, and 3746 panel members in 1988. Panel members are selected and managed to be representative of the continental United States population, age 13 and older.

For the purposes of this analysis, several determinations were made: (1) for each dairy product category frequency of consumption is employed, and is treated as an ordered multinomial variable; (2) explanatory variables include reported annual household income, age of the panel member, household size, race, and selected attitude scale variables. The attitude scale variables are combined on the basis of alpha factoring to represent a series of Likert Scale indices. Generally the attitude variables are grouped into positive products attitudes and negative product attitudes.

Panel members are asked a series of questions whereby they record the frequency of use over a given time period. This frequency of consuming milk and dairy products is treated as a ordered response (1=no use, 2=light use, 3=moderate use, and 4=heavy use) in this study. The frequency of use responses were recoded to a four category ordinal use scale. For fluid milk products this recoding produced the following use categories:

Category		Original survey frequency of use
1	Non-User	Never drink fluid dairy product.
2	Light-User	Drink occasionally / Drink often but not every day.
3	Moderate-User	Drink 1 or 2 glasses per day.
4	Heavy-User	Drink 3 glasses or more every day.

The recoding for the soft and hard manufactured dairy products produced the following use categories:

Category		Original survey frequency of use
1	Non-Use	Never use the product.
2	Light-User	Once to several times a year use.
3	Moderate-Use	Once a month to several times a week use.
4	Heavy-Use	Nearly every day use.

In addition, survey panel members respond to an extensive set of questions on each product category and concerning food use and attitudes in general. For example, in the panel survey, members are asked to respond to questions such as: Lowfat or skim milk tastes flat and watery. The respondent is then presented with an attitude scale variable ranging from 1:" Definitely disagree", to 6:"Definitely agree". From this type of question and response the correlation between the level of product use and the attitude scale can be calculated.

While it is of interest to estimate the effects of specific demographic and attitude variables on the probability of the level of product use at a specific point in time, i.e., a single survey period; it is of equal interest to assess the extent to which these effects of changed over the period 1976 to 1988. The data are constructed so as to answer questions of the nature "Has the effect of health attitudes on the probability of use increased, declined, or remained unchanged over this period of time. For example, as the consumer is exposed to increasing amount of information relative to health and nutrition issues, it might be expected that the negative effect of fat and cholesterol related attitudes on dairy product use would increase.

Sociodemographic variables

The primary survey variables used in this study are as follows: the first five explanatory variables (MT, FT, F5, F6-12, FE, and AM) represent family composition; male teenager (MT), female teenager (FT), female panel member with child 5 years old or younger (F5), female panel member with child 6-12 years old (F6_12), female panel member without children (FE), and adult males (AM). These variables are coded as (0/1). The variables (IN0-IN8) refer to categories of annual household income groups. The income categories are: (0) less that $5,000; (1) $5,000 - 9,999; (2) $10,000 - 14,999; (3) $15,000 - 19,999; (4) $20,000 - 24,999; (5) $25,000 - 29,999; (6) $30,000 - 39,000; (7) $40,000 - 49,000; (8) over $50,000. HOS is the indicator of household size which ranged from 1 member to eight or more members. RAC indicates Caucasian race or otherwise and is coded (0/1). The composition of members of the household, the household income, household size, and race represents an attempt to capture the differential impacts of the separate groups on the probability of drinking or using milk and dairy

products. These variables are listed in appendix Table 1. Note, the tables referred to in this paper are divided between those in included in the body of the paper and those included in the appendix table set.

Selected attitude variables

Variables regarding a respondent's attitude toward milk or dairy product characteristics, represent scale variables for an attitude. The choices for these variables range from one to six. One and six refer to definitely (strongly) disagree, and definitely (strongly) agree respectively. That is, a variable with higher mean value indicates respondent tends to agree with the related statement. These variables are listed in appendix Table 2.

For each survey completed the panel member responds to a series of attitude statements some of which are highly similar in capturing an underlying attitude about a specific product dimension. For example, "I like the taste of milk". Another question "Milk is refreshing". These questions may be indicators of an underlying positive attitude toward milk. The statistical procedure of factor analysis was utilized to test the closeness of similar attitude questions and provide a method of combining questions when appropriate to do so. As a result, for each dairy product category, a larger number of attitude questions were combined into essentially two Likert scale indices. The scale variables, the attitude questions comprising each scale and the range of the variable are presented in Table 2. The mean response level for each Likert scale index by dairy commodity and survey year are presented in Table 3. A positive scale index which reflected the panel members underlying positive attitudes toward the product, and a negative scale index which reflected the panel members negative attitudes toward the dairy product. For all products and years, the positive scale index reflects a basic taste preference and healthful attitude. The negative scale index reflects primarily dietary fat and cholesterol attributes.

Table 2. Likert scale indices and the composite attitude questions, means, and range of response.

Likert Scale Indices* and the composite attitude questions	Range of Scale Index
Likert Scale: LSMIR - Milk is refreshing - I like the taste of milk - Milk is refreshing - Milk is required for a balance diet - Milk is relaxing - Milk is more refreshing that soft drinks	5.0 - 30.0
Likert Scale: LSMNA - Milk if not healthful - Milk is fattening - Milk help produce cholesterol - Milk can cause heart disease - Milk is high in cholesterol	4.0 - 24.0
Likert Scale: LSLSS = Lowfat / skim substitutes for regular whole milk - Lowfat milk is equally nutritious as regular whole milk - Skim milk is equally nutritious as regular whole milk	2.0 - 12.0
Likert Scale: LSCPA = Cheese positive attitudes - Cheese is a healthful food - I like the taste of cheese	2.0 - 12.0
Likert Scale: LSCNA = Cheese negative attitude - Cheese is fattening - Cheese helps produce cholesterol - Cheese can cause heart disease - Cheese is high in cholesterol	4.0 - 24.0
Likert Scale: LSICP = Ice cream positive attitudes - I like the taste of Ice cream - Ice cream is a good source of calcium - Ice cream is a healthful food - Ice cream is refreshing	4.0 - 24.0
Likert Scale: LSICN = Ice cream negative attitudes - Ice cream is fattening - Ice cream helps produce cholesterol - Ice cream is high in cholesterol - Ice cream can cause heart disease	4.0 - 24.0
Likert Scale: LSYCA = Yogurt positive health attitudes - Yogurt is excellent for dieting - Yogurt is low in calories	2.0 - 12.0

* Likert scale indices are the summation of individual item scores based on the use of factor analysis with a varimax rotation designed to identify those response items with a high degree of inter-item correlation. The Cronbach Alpha for these items exceeds +0.8 for all scale variables.

Table 3. Likert scale indices and the mean response by dairy product category and survey year.

	Any Fluid Milk			Regular Whole Milk			Lowfat / Skim Milk			Cheese (non-cottage)		
	Year of the survey instrument											
Likert Scale	1976	1982	1988	1976	1982	1988	1976	1982	1988	1976	1982	1988
LSMIR	22.98	23.22	23.03	22.99	23.22	23.06	22.98	23.22	23.07			
LSMNA	13.96	13.66	13.94	13.96	13.66	13.93	13.95	13.66	13.94			
LSLSS							8.23	8.03	8.08			
LSCPA										5.30[a]	10.75	10.51
LSCNA										15.93	16.51	16.77

a: mean score based on a single item in 1976. Not comparable to other years.

Table 3 continued. Likert scale indices and the mean response by dairy product category and survey year.

	Ice Cream			Ice Milk			Any type of Yogurt		
	Year of the survey instrument								
Likert Scale	1976	1982	1988	1976	1982	1988	1976	1982	1988
LSICP	na	19.87	19.85	na	19.87	19.85	na	19.87	19.85
LSICN	na	17.26	17.54	na	17.25	17.54	na	17.25	17.54
LSYCA	na	8.05	7.83	na	8.05	7.83	na	8.05	7.83

na: not sufficient information to construct an index for these years.

Estimated Net Effects of Age, Taste, and Health Variables

The maximum likelihood estimates for the ordered logit models for (i) the fluid milk group, (ii) non-cottage cheese, (iii) Ice cream, (iv) ice milk, and (v) any type yogurt, along with the summary statistics of the estimation are given in appendix tables sets 3.a-g through 5.a-g. The estimated probability of a panel member being a (1) non-user, (2) light-user, (3) moderate-user, (4) heavy-user is a function of the economic, demographic and attitudinal variables. Each column lists the estimated ordered logit model for a specific dairy product category. The number of observations, the proportion of sample observations in each category, and the likelihood ratio Chi-square for the entire model are also listed for each year.

As these models as setup, the reference unit is defined by the omitted category. In this analysis the omitted category is defined as a non-caucasian female without children twelve years old or less and with an income of less than $5,000. All inferences based on the estimated parameters are relative to this category of dairy product consumer.

Effects of consumer age and gender across dairy commodities

The effects of gender are captured by the MT, FT, F5, F6_12, AM variables. The respondents age is measured as a continuous variable. The relative likelihood associated with each of these variables are listed in appendix Tables 6.a through 6.g for each of the dairy commodities.

For the fluid milk products, CFAM, CFWM, and CFLS, the effect of age is consistently negative. The likelihood of a respondent being in a higher use category, e.g., heavy user as compared to a moderate user, declines with age. This is evident for all of the fluid products (appendix tables 6.a,6.b, and 6.c). The age of the respondent is not a significant factor for cheese, ice cream, ice milk, and yogurt. The likelihood of being in a higher use category does not change with the age of the respondent for these commodities (appendix tables 6.d,6.e,6.f,6.g). The only exception is for ice cream and yogurt in the 1988 survey. Here the age variable indicates a reduction in the likelihood for each ten year increment in the respondents age. However, there is no consistency across the time period and therefore the evidence is more compelling in the direction of no direct age effect. With the ageing of the U.S. consumer population this is can be taken as very good news for the dairy industry. As was indicated by the consumption trends in Table 1, the hard and soft products are the per-capita growth areas for the dairy industry. The negative age effect for the fluid product area does indicate that the dairy industry will be under increasing pressure to find alternative product outlets for the milkfat which will not be consumed in fluid form.

The evidence on the effects of the gender/age dimension is much more pronounced across all of the sample time frames. For the composite fluid products category there does appear to be an increased likelihood of heavy product use by male and female teens and adult males, relative to adult females (appendix table 6.a). What is striking is the consistent decline in the magnitude of this effect over the sampling time frame. In the 1976 survey period, male teens are almost three times (2.97) as likely to be heavy users of any type of fluid milk. In the 1982 and 1988 surveys this has declined to less than twice (1.76) as likely to be more frequent fluid milk users. This pattern is consistent for the regular whole milk category as well (appendix table 6.b). The category of lowfat/skim milk does not show any significant and consistent relationship between gender/age and frequency of use (appendix table 6.c). Other factors are more important for this category.

In the cheese and soft dairy products categories the gender/age pattern is much different

than that for the fluid products. In the case of Ice Cream there is a clear indication the male and female teens are from 1.5 to 2.5 times more likely to be more frequent users of these products than are adult females (appendix tables 6.d.-6.g). This relationship is evident but less pronounced for ice milk and yogurt as well. An interesting result from the 1988 survey on yogurt use is that females are the frequent heavy users while adult males are significantly less likely to use even moderate amounts of yogurt (appendix table 6.g). In the surveys of 1976 and 1982 there does not appear to be the same strong relationship which emerges clearly in the 1988 data.

Effects of consumer attitudes on health attributes across dairy commodities

The effects of the respondents positive and negative attitudes about the characteristics of the dairy product categories are summarized in table 4. The positive attitude variables for fluid products (LSMIR=milk is refreshing and healthful), soft products (LSICP=ice cream is refreshing and healthful), and hard products (LSCPA=cheese nutritious and tastes good) all have a pronounced effect on the likelihood of a respondent being a more frequent user of these products. It is striking that the negative attitude scale indices, across all products, are not statistically significant in their influence on the likelihood of product use. Whether a consumer is in the lowest or highest use group is positively influenced by positive attitudes but not negative attitudes. What this means is that expressions of concern over fat, cholesterol, and general health issues do not translate directly into lower dairy product use. Consumers can be defined as frequent users based on the strength of their general positive taste and nutrition attitudes but not on the basis of their negative attitudes health attitudes about these issues. Furthermore, there does not appear to be a statistically verifiable change in this conclusion over the 1976 through 1988 time period.

Table 4. A summary of the evidence on the effects of attitudes on the likelihood of dairy product use.

	General conclusion over all three sample years: 1976, 1982, 1988.						
	Dairy product categories						
	Fluid milk product categories						
	Any Fluid	Whole	Lowfat	Cheese	Ice Cream	Ice Milk	Yogurt
Attitude Variable	CFAM	CFWM	CFLS	CFOC	CFIC	CFIM	CFAY
LSMIR	S/P	S/P	S/P				
LSMNA	N/S	N/S	N/S				
LSLSS			S/P				
LSCPA				S/P			
LSCNA				N/S			
LSICP					S/P	N/S	N/S
LSICN					N/S	N/S	N/S
LSYCA					N/S	N/S	S/P
AFTM	S/N	N/S	N/S				
LFFW		S/P	S/N				

legend: S/P = significant and positive effect; S/N = significant and negative effect; N/S = no significant effect;

Evidence of significant parameter shifts over the survey time frame

For each of the ordered logit models in a given year, the independent variables measure the relative logarithmic likelihood of that variable increasing or decreasing the probability of the user being in one of the categories of use relative to the reference user. A comparison of the sign and magnitude of these estimated parameters across years provides an indication of any significant time shift in these effects. Direct comparison of the estimated parameters can be misleading by not taking into account the estimated sampling variance of the parameters for each year. A statistical test of the difference in the magnitude of the parameters across years would indicate whether or not the estimated effects had changed by more that random chance over the sample time frame. These calculated differences, standard errors, and asymptotic t values are presented in appendix Tables 7.a through 7.g.

Tables 5 and 6 present a summary of the results of the pairwise statistical tests for each

dairy commodity. Only those estimated effect differences which are statistically significant at the 0.10 level are identified. A statistically significant difference indicates a non-random change in the strength and/or the direction of the effect that the variable exerts on the likelihood of use or non-use.

Table 5 presents the summary finding for the fluid milk group, CFAM, CFWM, and CFLS. For the category - Any Type of Fluid Milk (CFAM) - the period 1982 through 1988 provides evidence of an increase in the effect of Adult male, high levels of income, caucasian background, positive milk attitudes, and the taste attribute AFTM. The category - Regular Whole Milk (CFWM) - there appears to be a significant reversal of the effect of higher levels of income. This occurs over the period 1976 - 1982 and persists into 1988. Higher levels of income increase the likelihood of more frequent fluid product use in the 1976 survey. This shifts to a negative effect in the 1982 survey where higher levels of income reduce the likelihood of product use. While the strength of this effect does not change from 1982 to 1988, the negative relationship remains consistent.

Considering the two taste attribute variables - Milk has a bad aftertaste (AFTM), and Lowfat / skim milk tastes flat and watery (LFFW) - the effects are consistently negative and increase over the sample time frame. The likelihood of high frequency use declines with a stronger agreement that milk has a bad aftertaste and this effect appears to be strengthened from the 1982 to 1988 survey.

When considering the cheese and soft products presented in table 6 the most striking result is that of the significant shift in the effect of higher levels of income on the frequency of ice cream use. In the 1976 survey, the effect of income is positive indicating that higher levels of income result in higher probability of ice cream consumption. This result is consistent in the 1982 survey as well. However, over the period 1982 to 1988 there is a dramatic reversal in the direction of the income effect from positive to negative. In the 1988 survey the effect of higher levels of income are negative and are associated with a decrease in the likelihood of higher levels of ice cream consumption.

Table 5. A comparison of the time changes in the magnitude and sign of the independent variables on the likelihood of frequency dairy product use.

	Statistically significant asymptotic T-statistic on difference in estimated parameters					
	Any Type Milk		Regular Milk		Lowfat / Skim Milk	
Variable	1976-82	1982-88	1976-82	1982-88	1976-82	1982-88
Male Teen	nsc	nsc	nsc	nsc	nsc	nsc
Female Teen	nsc	nsc	nsc	nsc	nsc	nsc
Female with Child less than 5 years	nsc	nsc	nsc	nsc	nsc	nsc
Female with Child 6 to 12 years	nsc	nsc	nsc	nsc	nsc	nsc
Adult Male	decrease (+/+)	increase (+/+)	decrease (+/+)	nsc	decrease (+/+)	nsc
Income $5,000 - 9,999	decrease (+/+)	nsc	nsc	nsc	nsc	nsc
Income $10,000 - 14,999	nsc	nsc	switch (+/-)	nsc	nsc	nsc
Income $15,000 - 19,999	nsc	nsc	switch (+/-)	nsc	nsc	nsc
Income $20,000 - 24,999	nsc	nsc	switch (+/-)	nsc	nsc	nsc
Income 25,000 - 29,999	nsc	increase (+/+)	switch (+/-)	nsc	nsc	nsc
Income $30,000 - 39,999	nsc	nsc	switch (+/-)	nsc	nsc	nsc
Income $40,000 - 49,999	decrease (+/+)	increase (+/+)	switch (+/-)	nsc	nsc	nsc
Income over $49,999	decrease (+/+)	increase (+/+)	switch (+/-)	nsc	nsc	nsc
Racial Background	nsc	increase (+/+)	nsc	nsc	nsc	decrease (+/+)
Household Size	nsc	nsc	nsc	nsc	nsc	nsc
Age of Respondent	nsc	nsc	switch (-/+)	nsc	increase (-/-)	nsc
LSMIR	nsc	increase (+/+)	increase (+/+)	decrease (+/+)	nsc	nsc
LSMNA	nsc	nsc	nsc	nsc	nsc	nsc
LSLSS	nsc	nsc	nsc	nsc	nsc	nsc
AFTM	nsc	increase (-/-)	nsc	nsc	increase (-/-)	nsc
LFFW	nsc	nsc	increase (+/+)	nsc	increase (-/-)	nsc

Legend: Increase = estimated parameter in period i > period j;
Decrease = estimated parameter in period i < period j;
switch = estimated parameter changed sign;
(+/+) = estimated effect positive on likelihood of high frequency use;
(-/-) = estimated effect negative on likelihood of high frequency use;
(+/-) = estimated effect changed from positive to negative or opposite;
(ne) = no significant effect;
nsc = no statistically significant change in the estimated effect.

Table 6. A comparison of the time changes in the magnitude and sign of the independent variables on the likelihood of frequency dairy product use.

	Statistically significant asymptotic T-statistic on difference in estimated parameters							
	Cheese (non-cottage)		Ice Cream		Ice Milk		Any type Yogurt	
Variable	1976-82	1982-88	1976-82	1982-88	1976-82	1982-88	1976-82	1982-88
Male Teen	nsc	switch (-/+)	nsc	nsc	nsc	nsc	nsc	nsc
Female Teen	nsc	switch (-/+)	nsc	nsc	nsc	nsc	nsc	nsc
Female with Child less than 5 years	nsc	nsc	nsc	nsc	nsc	nsc	nsc	switch (ne/+)
Female with Child 6 to 12 years	nsc	nsc	nsc	decrease (+/ne)	nsc	nsc	nsc	nsc
Adult Male	nsc	nsc	nsc	nsc	nsc	nsc	nsc	nsc
Income $5,000 - 9,999	nsc	nsc	nsc	switch (+/-)	nsc	nsc	nsc	nsc
Income $10,000 - 14,999	nsc	nsc	nsc	switch (+/-)	nsc	nsc	nsc	nsc
Income $15,000 - 19,999	nsc	nsc	nsc	switch (+/-)	nsc	nsc	nsc	nsc
Income $20,000 - 24,999	nsc	nsc	nsc	switch (+/-)	nsc	nsc	nsc	nsc
Income 25,000 - 29,999	nsc	nsc	nsc	switch (+/-)	nsc	nsc	nsc	nsc
Income $30,000 - 39,999	nsc	nsc	nsc	switch (+/-)	nsc	nsc	nsc	nsc
Income $40,000 - 49,999	nsc	nsc	nsc	switch (+/-)	nsc	nsc	nsc	nsc
Income over $49,999	nsc	nsc	nsc	switch (+/-)	nsc	nsc	nsc	nsc
Racial Background	nsc	nsc	nsc	nsc	nsc	nsc	nsc	switch (-/+)
Household Size	switch (-/+)	nsc	nsc	nsc	nsc	nsc	nsc	nsc
Age of Respondent	nsc	nsc	nsc	nsc	nsc	nsc	nsc	nsc
LSCPA	nsc	nsc	nsc	nsc	nsc	nsc	nsc	nsc
LSCNA	nsc	nsc	nsc	nsc	nsc	nsc	nsc	nsc
LSICP	nsc	nsc	nsc	nsc	nsc	nsc	nsc	nsc
LSICN	nsc	nsc	nsc	nsc	nsc	nsc	nsc	switch (+/ne)
LSYCA	nsc	nsc	nsc	nsc	nsc	nsc	nsc	nsc

Legend: Increase = estimated parameter in period i > period j;
Decrease = estimated parameter in period i < period j;
switch = estimated parameter changed sign;
(+/+) = estimated effect positive on likelihood of high frequency use;
(-/-) = estimated effect negative on likelihood of high frequency use;
(+/-) = estimated effect changed from positive to negative or opposite;
(ne) = no significant effect;
nsc = no statistically significant change in the estimated effect.

Conclusions

This paper reports on a research study which investigated the relative importance of various attitudinal variables to the frequency and per-capita use of milk and dairy products. The consumer survey data was used to estimate a maximum likelihood logistics model for whole milk and for low fat/skim milk products. The frequency of product usage was estimated as a function of traditional socioeconomic variables and specific consumer attitude variables. The latter variables measured consumer perception of specific taste and health characteristics of the fluid milk products.

Relative price changes and shifts in consumers' real incomes play important roles in the changes observed in consumption patterns of dairy products. Often times these variables do not offer a complete explanation of shifts which we observe to take place in consumers purchasing habits. In the case of milk and dairy products, the 1970's and 1980's were a time wherein consumers shifted from consuming regular whole milk to lowfat/skim milk. This was also a period in which interest in generic promotion and producer financed advertising was offered as one way to stimulate consumer demand.

From this research it was determined that certain perceptions of product quality and/or characteristics are more important to consumers than others. These characteristics need to be the focus of promotional strategies and advertising campaigns designed to increase demand. Consumer use of whole milk and low fat milk are most sensitive to taste characteristics and less so to health related characteristics of the products. In the case of low fat milk products it appears that a significant consumption increase could be generated by either changing consumer perception that the product has a flat, watery taste, or possibly making direct modification to the product to eliminate this undesirable characteristic.

The results of this study suggest that an advertising campaign aimed at changing consumer attitudes toward milk taste would be most effective for increasing consumer frequency of consumption. The analysis of the health variables indicates that consumers are less sensitive to health attributes as compared to other product dimensions.

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Appendix Tables

Age, Health, and Taste Attributes of Dairy Products

Table 1. Definition of Model Variables

Ordinal Logit Variables		
CFAM	If drink any type milk	ordinal 1,2,3,4
CFWM	If drink regular whole milk	ordinal 1,2,3,4
CFLS	If drink lowfat fluid milk	ordinal 1,2,3,4
CFOC	If use non-cottage cheese (any type)	ordinal 1,2,3,4
CFIC	If use ice cream (any type)	ordinal 1,2,3,4
CFIM	If use ice milk (any type)	ordinal 1,2,3,4
CFAY	If use yogurt (any type)	ordinal 1,2,3,4
Exogenous Variables		
MT	Male teens (13-18)	
FT	Female teens (13-19)	
F5	Female with Child less than 6	
F6-12	Female with child 6-12	
FE	Female, no children	(omitted group)
AM	Adult Males	
AGEP	Age of respondent	
IN0	Annual Household Income less than $4,999	(omitted group)
IN1	Annual Household Income $5,000 - $9,999	
IN2	Annual Household Income $10,000 - $14,999	
IN3	Annual Household Income $15,000 - $19,999	
IN4	Annual Household Income $20,000 - $24,999	
IN5	Annual Household Income $25,000 - $29,999	
IN6	Annual Household Income $30,000 - $39,999	
IN7	Annual Household Income $40,000 - $49,999	
IN8	Annual Household Income $50,000 and over	
RAC	White	
NWR	Non Caucasin Group	(omitted group)
HOS	Household size	

Table 2. Attitudinal Variables

Positive fluid milk attitudes:		
ILTM	I like the taste of milk.	DD(1) ....DA(6)
REFM	Milk is refreshing.	DD(1) ....DA(6)
RELM	Milk is relaxing.	DD(1) ....DA(6)
BALM	Milk is required for diet.	DD(1) ....DA(6)
MMRS	Milk is more refreshing than Soft drinks	DD(1) ....DA(6)
Negative fluid milk health attitudes:		
FATM	Milk has too much fat.	DD(1) ....DA(6)
MHPC	Milk helps produce cholesterol.	DD(1) ....DA(6)
HATM	Milk can cause heart disease.	DD(1) ....DA(6)
MHCH	Milk is high in cholesterol.	DD(1) ....DA(6)
Positive lowfat/skim milk attitudes:		
SMNM	Skim milk is equal in nutrition	DD(1) ....DA(6)
LFNM	Lowfat milk is equal in nutrition	DD(1) ....DA(6)
Positive cheese attitudes:		
CIHF	Cheese is a healthful food.	DD(1) ....DA(6)
ILTC	I like the taste of cheese.	DD(1) ....DA(6)
Negative cheese health attitudes:		
CFAT	Cheese is fattening.	DD(1) ....DA(6)
CHPC	Cheese helps produce cholesterol.	DD(1) ....DA(6)
CCHD	Cheese can cause heart disease.	DD(1) ....DA(6)
CIHC	Cheese is high in calories.	DD(1) ....DA(6)
Positive ice cream attitudes:		
ITIC	I like the taste of Ice cream.	DD(1) ....DA(6)
ICGC	Ice cream is a good source of calcium	DD(1) ....DA(6)
ICHF	Ice cream is a healthful food.	DD(1) ....DA(6)
ICIR	Ice cream is a refreshing food.	DD(1) ....DA(6)
Negative ice cream health attitudes:		
ICIF	Ice cream is fattening.	DD(1) ....DA(6)
ICPC	Ice cream helps produce cholesterol.	DD(1) ....DA(6)
ICHC	Ice cream is high in calories.	DD(1) ....DA(6)
ICHD	Ice cream can cause heart disease.	DD(1) ....DA(6)
Positive yogurt attitudes:		
ILTY	I like the taste of yogurt.	DD(1) ....DA(6)
FYIC	Frozen yogurt tastes as good as Ice Cream	DD(1) ....DA(6)
LTFY	I like the taste of frozen yogurt.	DD(1) ....DA(6)
YEFD	Yogurt is excellent for dieting.	DD(1) ....DA(6)
YLIC	Yogurt is low in calories.	DD(1) ....DA(6)
General fluid milk taste characteristics:		
AFTM	Milk leaves a bad aftertaste.	DD(1) ....DA(6)
LFFL	Lowfat milk tastes flat and watery.	DD(1) ....DA(6)

DD(1): Definetly Disagree - DA(6): Definitly Agree

Table 3.a: AUTS ORDERED LOGIT MODELS 1976 SURVEY DATA - INTERACTION
Frequency of Any Type of Fluid Milk Use: CFAM

LOGISTIC REGRESSION PROCEDURE
DEPENDENT VARIABLE: CFAM

-2 LOG LIKELIHOOD FOR MODEL CONTAINING INTERCEPTS ONLY= 8512.89
MODEL CHI-SQUARE= 561.73 WITH 22 D.F. (SCORE STAT.) P=0.0 .
CONVERGENCE IN 5 ITERATIONS WITH 0 STEP HALVINGS R= 0.245.
MAX ABSOLUTE DERIVATIVE=0.2103D-05. -2 LOG L= 7957.48.
MODEL CHI-SQUARE= 555.41 WITH 22 D.F. (-2 LOG L.R.) P=0.0 .

VARIABLE	BETA	STD. ERROR	CHI-SQUARE	P	R
ALPHA1	-0.43134067	0.62717396	0.47	0.4916	
ALPHA2	-2.37538531	0.62864998	14.28	0.0002	
ALPHA3	-3.69596424	0.63111335	34.30	0.0000	
AGEP	-0.02889996	0.01172364	6.08	0.0137	-0.022
IN1	0.70905896	0.33784525	4.40	0.0358	0.017
IN2	0.43317920	0.27031139	2.57	0.1090	0.008
IN3	0.40660522	0.27591485	2.17	0.1406	0.004
IN4	0.57354659	0.27222160	4.44	0.0351	0.017
IN5	0.57363992	0.26910594	4.54	0.0330	0.017
IN6	0.58574399	0.27205641	4.64	0.0313	0.018
IN7	0.64738970	0.27845224	5.41	0.0201	0.020
IN8	0.60973391	0.26543382	5.28	0.0216	0.020
MT	1.09031824	0.19768192	30.42	0.0000	0.058
FT	0.43850233	0.19075294	5.28	0.0215	0.020
F5	-0.06932711	0.15492500	0.20	0.6545	0.000
F6_12	-0.09635291	0.14587636	0.44	0.5089	0.000
AM	0.60385684	0.10325842	34.20	0.0000	0.062
HOS	0.03538268	0.02709677	1.71	0.1916	0.000
RAC	0.40615089	0.16935345	5.75	0.0165	0.021
LSMIR	0.07675939	0.01572020	23.84	0.0000	0.051
LSMNA	-0.02391459	0.01800809	1.76	0.1842	0.000
AFTM	-0.10274128	0.04529084	5.15	0.0233	-0.019
AAI1	0.00030465	0.00034368	0.79	0.3754	0.000
AAI2	0.00031200	0.00037027	0.71	0.3994	0.000
AAI3	0.00024084	0.00097128	0.06	0.8042	0.000

C=0.676 SOMER DYX=0.353 GAMMA=0.354 TAU-A=0.253

Table 3.b: AUTS ORDERED LOGIT MODELS 1976 SURVEY DATA - INTERACTION
Frequency of Regular Whole Milk Use: CFWM

LOGISTIC REGRESSION PROCEDURE
DEPENDENT VARIABLE: CFWM

-2 LOG LIKELIHOOD FOR MODEL CONTAINING INTERCEPTS ONLY= 7986.30.
MODEL CHI-SQUARE= 728.50 WITH 24 D.F. (SCORE STAT.) P=0.0 .
CONVERGENCE IN 6 ITERATIONS WITH 0 STEP HALVINGS R= 0.291.
MAX ABSOLUTE DERIVATIVE=0.5832D-10. -2 LOG L= 7261.05.
MODEL CHI-SQUARE= 725.25 WITH 24 D.F. (-2 LOG L.R.) P=0.0 .

VARIABLE	BETA	STD. ERROR	CHI-SQUARE	P	R
ALPHA1	-1.66714667	0.66138596	6.35	0.0117	
ALPHA2	-3.93560154	0.66451377	35.08	0.0000	
ALPHA3	-5.18862452	0.66820141	60.30	0.0000	
AGEP	-0.02564228	0.01269630	4.08	0.0434	-0.016
IN1	0.96428839	0.34178535	7.96	0.0048	0.027
IN2	0.68847657	0.27320563	6.35	0.0117	0.023
IN3	0.62813779	0.27840189	5.09	0.0241	0.020
IN4	0.73484660	0.27495197	7.14	0.0075	0.025
IN5	0.60044070	0.27092367	4.91	0.0267	0.019
IN6	0.48579052	0.27442956	3.13	0.0767	0.012
IN7	0.69339999	0.28053376	6.11	0.0134	0.023
IN8	0.57825959	0.26777763	4.66	0.0308	0.018
MT	1.07105889	0.20307541	27.82	0.0000	0.057
FT	0.36020717	0.19742096	3.33	0.0681	0.013
F5	0.06611731	0.16003658	0.17	0.6795	0.000
F6_12	0.15390419	0.15261500	1.02	0.3132	0.000
AM	0.87973078	0.10972255	64.28	0.0000	0.088
HOS	0.00527653	0.02793505	0.04	0.8502	0.000
RAC	0.06418031	0.17185413	0.14	0.7088	0.000
LSMIR	0.09882010	0.01649396	35.90	0.0000	0.065
LSMNA	-0.00026510	0.01863532	0.00	0.9887	0.000
AFTM	-0.10834698	0.04641388	5.45	0.0196	-0.021
LFFW	0.20906994	0.04089857	26.13	0.0000	0.055
AAI1	0.00010677	0.00036528	0.09	0.7701	0.000
AAI2	-0.00023953	0.00039037	0.38	0.5395	0.000
AAI3	0.00043062	0.00101592	0.18	0.6717	0.000
AAI4	-0.00022000	0.00089193	0.06	0.8052	0.000

C=0.708 SOMER DYX=0.415 GAMMA=0.417 TAU-A=0.283

Table 3.c: AUTS ORDERED LOGIT MODELS 1976 SURVEY DATA - INTERACTION
Frequency of Lowfat and Skim Milk Use: CFLS

LOGISTIC REGRESSION PROCEDURE
DEPENDENT VARIABLE: CFLS

-2 LOG LIKELIHOOD FOR MODEL CONTAINING INTERCEPTS ONLY= 7494.69.
MODEL CHI-SQUARE= 584.63 WITH 26 D.F. (SCORE STAT.) P=0.0 .
CONVERGENCE IN 5 ITERATIONS WITH 0 STEP HALVINGS R= 0.270.
MAX ABSOLUTE DERIVATIVE=0.1521D-04. -2 LOG L= 6895.18.
MODEL CHI-SQUARE= 599.51 WITH 26 D.F. (-2 LOG L.R.) P=0.0 .

VARIABLE	BETA	STD. ERROR	CHI-SQUARE	P	R
ALPHA1	-1.75724886	0.73045898	5.79	0.0161	
ALPHA2	-3.50860977	0.73236103	22.95	0.0000	
ALPHA3	-4.64630117	0.73470936	39.99	0.0000	
AGEP	-0.01488732	0.01383261	1.16	0.2818	0.000
IN1	-0.01388772	0.36145517	0.00	0.9694	0.000
IN2	-0.04665915	0.28678811	0.03	0.8708	0.000
IN3	-0.04220068	0.29280693	0.02	0.8854	0.000
IN4	0.33673034	0.28900301	1.36	0.2440	0.000
IN5	0.14271214	0.28548161	0.25	0.6171	0.000
IN6	0.31043844	0.28788464	1.16	0.2809	0.000
IN7	0.33218424	0.29552460	1.26	0.2610	0.000
IN8	0.43059567	0.28150378	2.34	0.1261	0.007
MT	0.03369440	0.20883362	0.03	0.8718	0.000
FT	0.15809007	0.20439747	0.60	0.4393	0.000
F5	0.26420224	0.16391712	2.60	0.1070	0.009
F6_12	0.13254345	0.15528850	0.73	0.3934	0.000
AM	0.42179012	0.11229030	14.11	0.0002	0.040
HOS	-0.03848133	0.02862278	1.81	0.1788	0.000
RAC	0.66809838	0.19195105	12.11	0.0005	0.037
LSMIR	0.06747751	0.01747286	14.91	0.0001	0.042
LSMNA	0.00072466	0.01948413	0.00	0.9703	0.000
LSLSS	0.13481670	0.02608178	26.72	0.0000	0.057
AFTM	-0.05218156	0.04827952	1.17	0.2798	0.000
LFFW	-0.27860793	0.04336622	41.27	0.0000	-0.072
AAI1	0.00018942	0.00038785	0.24	0.6253	0.000
AAI2	0.00030197	0.00040669	0.55	0.4578	0.000
AAI3	0.00030039	0.00105273	0.08	0.7754	0.000
AAI4	-0.00059897	0.00094355	0.40	0.5256	0.000
AAI5	-0.00062073	0.00053727	1.33	0.2479	0.000

C=0.696 SOMER DYX=0.393 GAMMA=0.394 TAU-A=0.258

Table 3.d: AUTS ORDERED LOGIT MODELS 1976 SURVEY DATA - INTERACTION
Frequency of Any Type of Cheese Use
(excluding cottage cheese): CFOC

LOGISTIC REGRESSION PROCEDURE
DEPENDENT VARIABLE: CFOC

-2 LOG LIKELIHOOD FOR MODEL CONTAINING INTERCEPTS ONLY= 5984.16
MODEL CHI-SQUARE= 142.90 WITH 20 D.F. (SCORE STAT.) P=0.0 .
CONVERGENCE IN 5 ITERATIONS WITH 0 STEP HALVINGS R= 0.131.
MAX ABSOLUTE DERIVATIVE=0.1893D-06. -2 LOG L= 5841.36.
MODEL CHI-SQUARE= 142.80 WITH 20 D.F. (-2 LOG L.R.) P=0.0 .

VARIABLE	BETA	STD. ERROR	CHI-SQUARE	P	R
ALPHA1	0.22930298	0.67744077	0.11	0.7350	
ALPHA2	-0.18420791	0.67685681	0.07	0.7855	
ALPHA3	-3.81605719	0.68210548	31.30	0.0000	
AGEP	-0.00209452	0.01337289	0.02	0.8755	0.000
IN1	0.15682406	0.35298347	0.20	0.6568	0.000
IN2	0.30131662	0.27791463	1.18	0.2783	0.000
IN3	0.46355167	0.28620198	2.62	0.1053	0.010
IN4	0.70691152	0.28244801	6.26	0.0123	0.027
IN5	0.80970673	0.27815775	8.47	0.0036	0.033
IN6	0.64440618	0.28020519	5.29	0.0215	0.023
IN7	1.02584174	0.28980834	12.53	0.0004	0.042
IN8	0.90960693	0.27257746	11.14	0.0008	0.039
MT	-0.12966993	0.21866764	0.35	0.5532	0.000
FT	-0.07132834	0.21425460	0.11	0.7392	0.000
F5	0.09400339	0.17581534	0.29	0.5929	0.000
F6_12	0.34351842	0.16728661	4.22	0.0400	0.019
AM	0.30362828	0.11856697	6.56	0.0104	0.028
HOS	-0.07368269	0.03027892	5.92	0.0150	-0.026
RAC	0.72461111	0.18144911	15.95	0.0001	0.048
CIHF	0.25072155	0.08829957	8.06	0.0045	0.032
LSCNA	0.01954350	0.02159353	0.82	0.3654	0.000
AAI6	0.00079238	0.00196655	0.16	0.6870	0.000
AAI7	-0.00094264	0.00044604	4.47	0.0346	-0.020

C=0.612 SOMER DYX=0.225 GAMMA=0.229 TAU-A=0.107

Table 3.e: AUTS ORDERED LOGIT MODELS 1976 SURVEY DATA - INTERACTION
Frequency of Any Type of Ice Cream Use: CFIC

LOGISTIC REGRESSION PROCEDURE
DEPENDENT VARIABLE: CFIC

-2 LOG LIKELIHOOD FOR MODEL CONTAINING INTERCEPTS ONLY= 6094.80
MODEL CHI-SQUARE= 125.96 WITH 16 D.F. (SCORE STAT.) P=0.0 .
CONVERGENCE IN 5 ITERATIONS WITH 0 STEP HALVINGS R= 0.124.
MAX ABSOLUTE DERIVATIVE=0.3246D-08. -2 LOG L= 5968.71.
MODEL CHI-SQUARE= 126.08 WITH 16 D.F. (-2 LOG L.R.) P=0.0 .

VARIABLE	BETA	STD. ERROR	CHI-SQUARE	P	R
ALPHA1	2.04448446	0.37697978	29.41	0.0000	
ALPHA2	0.88169960	0.37240553	5.61	0.0179	
ALPHA3	-2.98431130	0.37709106	62.63	0.0000	
AGEP	-0.00144454	0.00358991	0.16	0.6874	0.000
IN1	0.17725464	0.33133257	0.29	0.5927	0.000
IN2	0.49694697	0.26344068	3.56	0.0592	0.016
IN3	0.36682183	0.27137850	1.83	0.1765	0.000
IN4	0.69609256	0.26938326	6.68	0.0098	0.028
IN5	0.64775524	0.26433737	6.00	0.0143	0.026
IN6	0.81485137	0.26731008	9.29	0.0023	0.035
IN7	0.71595935	0.27848949	6.61	0.0101	0.028
IN8	0.63329993	0.25824513	6.01	0.0142	0.026
MT	0.61787296	0.22003191	7.89	0.0050	0.031
FT	0.45010097	0.21634506	4.33	0.0375	0.020
F5	0.16010010	0.17814532	0.81	0.3688	0.000
F6_12	0.12577581	0.17052239	0.54	0.4608	0.000
AM	0.03568256	0.11759830	0.09	0.7616	0.000
HOS	0.11772603	0.03079286	14.62	0.0001	0.045
RAC	-0.09198016	0.18078827	0.26	0.6109	0.000

C=0.609 SOMER DYX=0.218 GAMMA=0.221 TAU-A=0.095

Table 3.f: AUTS ORDERED LOGIT MODELS 1976 SURVEY DATA - INTERACTION
Frequency of Any Type of Ice Milk Use: CFIM

LOGISTIC REGRESSION PROCEDURE
DEPENDENT VARIABLE: CFIM

-2 LOG LIKELIHOOD FOR MODEL CONTAINING INTERCEPTS ONLY= 8377.97
MODEL CHI-SQUARE= 103.46 WITH 16 D.F. (SCORE STAT.) P=0.0 .
CONVERGENCE IN 5 ITERATIONS WITH 0 STEP HALVINGS R= 0.092.
MAX ABSOLUTE DERIVATIVE=0.1407D-11. -2 LOG L= 8274.97.
MODEL CHI-SQUARE= 103.00 WITH 16 D.F. (-2 LOG L.R.) P=0.0 .

VARIABLE	BETA	STD. ERROR	CHI-SQUARE	P	R
ALPHA1	0.31815009	0.31761566	1.00	0.3165	
ALPHA2	-0.84650693	0.31785957	7.09	0.0077	
ALPHA3	-3.53317113	0.33113954	113.84	.	
AGEP	-0.00278426	0.00303867	0.84	0.3595	0.000
IN1	0.27825148	0.28970817	0.92	0.3368	0.000
IN2	0.06980230	0.23068493	0.09	0.7622	0.000
IN3	-0.01682289	0.23707893	0.01	0.9434	0.000
IN4	-0.10539728	0.23484089	0.20	0.6536	0.000
IN5	-0.07316270	0.23068029	0.10	0.7511	0.000
IN6	-0.07831271	0.23251328	0.11	0.7363	0.000
IN7	-0.39792550	0.24204735	2.70	0.1002	-0.009
IN8	-0.32042215	0.22633991	2.00	0.1569	-0.001
MT	0.42089708	0.18401627	5.23	0.0222	0.020
FT	0.22054052	0.18050934	1.49	0.2218	0.000
F5	0.00624069	0.14777790	0.00	0.9663	0.000
F6_12	0.07134951	0.14018416	0.26	0.6108	0.000
AM	-0.02859238	0.09935148	0.08	0.7735	0.000
HOS	0.09617576	0.02550012	14.22	0.0002	0.038
RAC	-0.22185300	0.15117265	2.15	0.1422	-0.004

C=0.575 SOMER DYX=0.151 GAMMA=0.152 TAU-A=0.101

Table 3.g: AUTS ORDERED LOGIT MODELS 1976 SURVEY DATA - INTERACTION
Frequency of Any Type of Yogurt Use: CFAY

LOGISTIC REGRESSION PROCEDURE
DEPENDENT VARIABLE: CFAY

-2 LOG LIKELIHOOD FOR MODEL CONTAINING INTERCEPTS ONLY= 7760.91
MODEL CHI-SQUARE= 67.34 WITH 16 D.F. (SCORE STAT.) P=0.0000.
CONVERGENCE IN 5 ITERATIONS WITH 0 STEP HALVINGS R= 0.068.
MAX ABSOLUTE DERIVATIVE=0.0 . -2 LOG L= 7692.97.
MODEL CHI-SQUARE= 67.94 WITH 16 D.F. (-2 LOG L.R.) P=0.0000.

VARIABLE	BETA	STD. ERROR	CHI-SQUARE	P	R
ALPHA1	-0.38045824	0.33285315	1.31	0.2530	
ALPHA2	-1.29794496	0.33353203	15.14	0.0001	
ALPHA3	-3.71919639	0.34626584	115.37	.	
AGEP	-0.00157189	0.00325430	0.23	0.6291	0.000
IN1	0.20278109	0.30116127	0.45	0.5007	0.000
IN2	0.09493248	0.24244751	0.15	0.6954	0.000
IN3	0.15423565	0.24851942	0.39	0.5349	0.000
IN4	0.28550145	0.24545385	1.35	0.2448	0.000
IN5	0.35600755	0.24077220	2.19	0.1392	0.005
IN6	0.43925090	0.24283678	3.27	0.0705	0.013
IN7	0.22733339	0.25260417	0.81	0.3681	0.000
IN8	0.52596765	0.23620191	4.96	0.0260	0.020
MT	-0.00182544	0.19243693	0.00	0.9924	0.000
FT	0.13760940	0.18775008	0.54	0.4636	0.000
F5	0.12980984	0.15398661	0.71	0.3992	0.000
F6_12	0.09993622	0.14521242	0.47	0.4913	0.000
AM	-0.31421917	0.10233056	9.43	0.0021	-0.031
HOS	0.00903200	0.02643324	0.12	0.7326	0.000
RAC	-0.06675065	0.15646730	0.18	0.6697	0.000

C=0.567 SOMER DYX=0.134 GAMMA=0.136 TAU-A=0.082

Table 4.a: AUTS ORDERED LOGIT MODELS 1982 SURVEY DATA - INTERACTION
Frequency of Any Type of Fluid Milk Use: CFAM

LOGISTIC REGRESSION PROCEDURE
DEPENDENT VARIABLE: CFAM

-2 LOG LIKELIHOOD FOR MODEL CONTAINING INTERCEPTS ONLY= 8758.21
MODEL CHI-SQUARE= 379.36 WITH 22 D.F. (SCORE STAT.) P=0.0 .
CONVERGENCE IN 5 ITERATIONS WITH 0 STEP HALVINGS R= 0.196.
MAX ABSOLUTE DERIVATIVE=0.4299D-07. -2 LOG L= 8378.52.
MODEL CHI-SQUARE= 379.69 WITH 22 D.F. (-2 LOG L.R.) P=0.0 .

VARIABLE	BETA	STD. ERROR	CHI-SQUARE	P	R
ALPHA1	-0.76668418	0.57841980	1.76	0.1850	
ALPHA2	-2.14556287	0.57940273	13.71	0.0002	
ALPHA3	-3.37135894	0.58260307	33.49	0.0000	
AGEP	-0.01455413	0.01142725	1.62	0.2028	0.000
IN1	-0.11773167	0.17866745	0.43	0.5099	0.000
IN2	-0.04627072	0.17057802	0.07	0.7862	0.000
IN3	-0.10446157	0.16747595	0.39	0.5328	0.000
IN4	-0.02991071	0.16854714	0.03	0.8591	0.000
IN5	-0.06287552	0.17194673	0.13	0.7146	0.000
IN6	-0.02916791	0.17113839	0.03	0.8647	0.000
IN7	-0.06601593	0.19298000	0.12	0.7323	0.000
IN8	-0.17583702	0.20660303	0.72	0.3947	0.000
MT	0.54587625	0.20553376	7.05	0.0079	0.024
FT	0.38880615	0.20156397	3.72	0.0537	0.014
F5	0.23675748	0.16720841	2.00	0.1568	0.001
F6_12	-0.17636357	0.14817305	1.42	0.2339	0.000
AM	0.22656860	0.11694850	3.75	0.0527	0.014
HOS	0.02674326	0.02680249	1.00	0.3184	0.000
RAC	0.33773660	0.17083622	3.91	0.0480	0.015
LSMIR	0.07786510	0.01497670	27.03	0.0000	0.053
LSMNA	-0.00940703	0.01889454	0.25	0.6186	0.000
AFTM	-0.07796780	0.04737459	2.71	0.0998	-0.009
AAI1	-0.00014529	0.00033792	0.18	0.6672	0.000
AAI2	-0.00016519	0.00040537	0.17	0.6836	0.000
AAI3	0.00113461	0.00103422	1.20	0.2726	0.000

C=0.643 SOMER DYX=0.286 GAMMA=0.287 TAU-A=0.202

Table 4.b: AUTS ORDERED LOGIT MODELS 1982 SURVEY DATA - INTERACTION
Frequency of Regular Whole Milk Use: CFWM

LOGISTIC REGRESSION PROCEDURE
DEPENDENT VARIABLE: CFWM

-2 LOG LIKELIHOOD FOR MODEL CONTAINING INTERCEPTS ONLY= 8431.48
MODEL CHI-SQUARE= 909.42 WITH 24 D.F. (SCORE STAT.) P=0.0 .
CONVERGENCE IN 6 ITERATIONS WITH 0 STEP HALVINGS R= 0.320.
MAX ABSOLUTE DERIVATIVE=0.4124D-09. -2 LOG L= 7519.09.
MODEL CHI-SQUARE= 912.39 WITH 24 D.F. (-2 LOG L.R.) P=0.0 .

VARIABLE	BETA	STD. ERROR	CHI-SQUARE	P	R
ALPHA1	-4.21423569	0.63161372	44.52	0.0000	
ALPHA2	-6.25306431	0.63680790	96.42	.	
ALPHA3	-7.84521174	0.64435547	148.24	.	
AGEP	0.02757257	0.01261704	4.78	0.0289	0.018
IN1	0.22953990	0.18443962	1.55	0.2133	0.000
IN2	-0.12822216	0.17676695	0.53	0.4682	0.000
IN3	-0.22549080	0.17416261	1.68	0.1954	0.000
IN4	-0.21907548	0.17585877	1.55	0.2129	0.000
IN5	-0.19225622	0.17864191	1.16	0.2818	0.000
IN6	-0.21177052	0.17855091	1.41	0.2356	0.000
IN7	-0.18422036	0.20109124	0.84	0.3596	0.000
IN8	-0.12969435	0.21224753	0.37	0.5412	0.000
MT	0.57706012	0.21002285	7.55	0.0060	0.026
FT	0.17880440	0.20789249	0.74	0.3897	0.000
F5	0.19443443	0.17229839	1.27	0.2591	0.000
F6_12	-0.04682982	0.15394815	0.09	0.7610	0.000
AM	0.42201138	0.12170412	12.02	0.0005	0.034
HOS	0.04174772	0.02787444	2.24	0.1342	0.005
RAC	0.14815027	0.17564610	0.71	0.3990	0.000
LSMIR	0.16467943	0.01613438	104.18	.	0.110
LSMNA	0.03449402	0.01930140	3.19	0.0739	0.012
AFTM	0.03764229	0.04878401	0.60	0.4403	0.000
LFFW	0.35622925	0.04076495	76.36	.	0.094
AAI1	-0.00085466	0.00036181	5.58	0.0182	-0.021
AAI2	-0.00139574	0.00041766	11.17	0.0008	-0.033
AAI3	-0.00199123	0.00108365	3.38	0.0661	-0.013
AAI4	-0.00195654	0.00091235	4.60	0.0320	-0.018

C=0.721 SOMER DYX=0.442 GAMMA=0.444 TAU-A=0.306

Table 4.c: AUTS ORDERED LOGIT MODELS 1982 SURVEY DATA - INTERACTION
Frequency of Lowfat and Skim Milk Use: CFLS

LOGISTIC REGRESSION PROCEDURE
DEPENDENT VARIABLE: CFLS

-2 LOG LIKELIHOOD FOR MODEL CONTAINING INTERCEPTS ONLY= 8527.75.
MODEL CHI-SQUARE= 857.22 WITH 26 D.F. (SCORE STAT.) P=0.0 .
CONVERGENCE IN 6 ITERATIONS WITH 0 STEP HALVINGS R= 0.312.
MAX ABSOLUTE DERIVATIVE=0.6645D-10. -2 LOG L= 7647.94.
MODEL CHI-SQUARE= 879.81 WITH 26 D.F. (-2 LOG L.R.) P=0.0 .

VARIABLE	BETA	STD. ERROR	CHI-SQUARE	P	R
ALPHA1	0.18305729	0.67623591	0.07	0.7866	
ALPHA2	-1.38645849	0.67631558	4.20	0.0404	
ALPHA3	-2.97418084	0.67860206	19.21	0.0000	
AGEP	-0.06185376	0.01396343	19.62	0.0000	-0.045
IN1	0.06821065	0.19024612	0.13	0.7199	0.000
IN2	0.13706029	0.18168381	0.57	0.4506	0.000
IN3	0.45827567	0.17904222	6.55	0.0105	0.023
IN4	0.43669498	0.18069793	5.84	0.0157	0.021
IN5	0.51610025	0.18320135	7.94	0.0048	0.026
IN6	0.51583615	0.18272968	7.97	0.0048	0.026
IN7	0.40616932	0.20381850	3.97	0.0463	0.015
IN8	0.39132107	0.21367127	3.35	0.0670	0.013
MT	-0.13161468	0.21469619	0.38	0.5399	0.000
FT	-0.08333424	0.21022161	0.16	0.6918	0.000
F5	0.15356900	0.17163897	0.80	0.3709	0.000
F6_12	-0.36861297	0.15191511	5.89	0.0152	-0.021
AM	-0.05296937	0.12070971	0.19	0.6608	0.000
HOS	-0.00441129	0.02815281	0.02	0.8755	0.000
RAC	0.57350418	0.18176265	9.96	0.0016	0.031
LSMIR	0.06169109	0.01628240	14.36	0.0002	0.038
LSMNA	-0.03544198	0.01986481	3.18	0.0744	-0.012
LSLSS	0.08346661	0.02769026	9.09	0.0026	0.029
AFTM	-0.05367424	0.04976672	1.16	0.2808	0.000
LFFW	-0.43929242	0.04311410	103.82	.	-0.109
AAI1	0.00094275	0.00037510	6.32	0.0120	0.022
AAI2	0.00118475	0.00042552	7.75	0.0054	0.026
AAI3	0.00111650	0.00108818	1.05	0.3049	0.000
AAI4	0.00214895	0.00094957	5.12	0.0236	0.019
AAI5	0.00041548	0.00060047	0.48	0.4890	0.000

C=0.722 SOMER DYX=0.445 GAMMA=0.446 TAU-A=0.313

Table 4.d: AUTS ORDERED LOGIT MODELS 1982 SURVEY DATA - INTERACTION
Frequency of Any Type of Cheese Use
(excluding cottage cheese): CFOC

LOGISTIC REGRESSION PROCEDURE
DEPENDENT VARIABLE: CFOC

-2 LOG LIKELIHOOD FOR MODEL CONTAINING INTERCEPTS ONLY= 6170.54
MODEL CHI-SQUARE= 284.21 WITH 20 D.F. (SCORE STAT.) P=0.0 .
CONVERGENCE IN 6 ITERATIONS WITH 0 STEP HALVINGS R= 0.199.
MAX ABSOLUTE DERIVATIVE=0.3162D-10. -2 LOG L= 5886.16.
MODEL CHI-SQUARE= 284.38 WITH 20 D.F. (-2 LOG L.R.) P=0.0 .

VARIABLE	BETA	STD. ERROR	CHI-SQUARE	P	R
ALPHA1	-1.16154829	0.68908043	2.84	0.0919	
ALPHA2	-1.54988497	0.68888112	5.06	0.0245	
ALPHA3	-5.33686120	0.69741809	58.56	0.0000	
AGEP	-0.00494264	0.01413661	0.12	0.7266	0.000
IN1	-0.01506077	0.20439944	0.01	0.9413	0.000
IN2	0.26531406	0.19303671	1.89	0.1693	0.000
IN3	0.38232389	0.19006656	4.05	0.0443	0.018
IN4	0.41425295	0.19219324	4.65	0.0311	0.021
IN5	0.47879492	0.19565094	5.99	0.0144	0.025
IN6	0.48323831	0.19604575	6.08	0.0137	0.026
IN7	0.61119010	0.21734492	7.91	0.0049	0.031
IN8	0.56916407	0.23123308	6.06	0.0138	0.026
MT	-0.63940235	0.23488680	7.41	0.0065	-0.030
FT	-0.55293782	0.23260546	5.65	0.0174	-0.024
F5	0.10447754	0.19172677	0.30	0.5858	0.000
F6_12	0.00854286	0.16931368	0.00	0.9598	0.000
AM	-0.02116697	0.13585737	0.02	0.8762	0.000
HOS	0.04284817	0.03068582	1.95	0.1626	0.000
RAC	0.75455432	0.19460483	15.03	0.0001	0.046
LSCPA	0.35252818	0.04786466	54.24	0.0000	0.092
LSCNA	-0.01768731	0.02222296	0.63	0.4261	0.000
AAI6	-0.00124381	0.00108260	1.32	0.2506	0.000
AAI7	0.00004315	0.00047731	0.01	0.9280	0.000

C=0.652 SOMER DYX=0.303 GAMMA=0.308 TAU-A=0.144

Table 4.e: AUTS ORDERED LOGIT MODELS 1982 SURVEY DATA - INTERACTION
Frequency of Any Type of Ice Cream Use: CFIC

LOGISTIC REGRESSION PROCEDURE
DEPENDENT VARIABLE: CFIC

-2 LOG LIKELIHOOD FOR MODEL CONTAINING INTERCEPTS ONLY= 5285.71
MODEL CHI-SQUARE= 228.91 WITH 22 D.F. (SCORE STAT.) P=0.0 .
CONVERGENCE IN 5 ITERATIONS WITH 0 STEP HALVINGS R= 0.183.
MAX ABSOLUTE DERIVATIVE=0.3202D-04. -2 LOG L= 5064.50.
MODEL CHI-SQUARE= 221.20 WITH 22 D.F. (-2 LOG L.R.) P=0.0 .

VARIABLE	BETA	STD. ERROR	CHI-SQUARE	P	R
ALPHA1	-0.90601321	0.86821745	1.09	0.2967	
ALPHA2	-2.19638931	0.86679913	6.42	0.0113	
ALPHA3	-6.67720831	0.88054679	57.50	0.0000	
AGEP	0.00806192	0.01757244	0.21	0.6464	0.000
IN1	0.14368398	0.21846446	0.43	0.5107	0.000
IN2	0.20623134	0.20795283	0.98	0.3213	0.000
IN3	0.30796936	0.20555201	2.24	0.1341	0.007
IN4	0.30519137	0.20760079	2.16	0.1415	0.006
IN5	0.31554375	0.21220916	2.21	0.1370	0.006
IN6	0.37766404	0.21296941	3.14	0.0762	0.015
IN7	0.71143675	0.24373845	8.52	0.0035	0.035
IN8	0.56017507	0.25767681	4.73	0.0297	0.023
MT	0.90658588	0.26345567	11.84	0.0006	0.043
FT	0.70715334	0.26043696	7.37	0.0066	0.032
F5	0.43486508	0.21307668	4.17	0.0413	0.020
F6_12	0.54565492	0.19067526	8.19	0.0042	0.034
AM	0.36077417	0.14923433	5.84	0.0156	0.027
HOS	0.03238943	0.03507815	0.85	0.3558	0.000
RAC	0.33481106	0.21471889	2.43	0.1189	0.009
LSICP	0.14475873	0.03207052	20.37	0.0000	0.059
LSICN	-0.00980638	0.02687877	0.13	0.7152	0.000
LSYCA	0.01112960	0.03654423	0.09	0.7607	0.000
AAI8	0.00023495	0.00068666	0.12	0.7322	0.000
AAI9	-0.00067114	0.00058820	1.30	0.2539	0.000
AAI10	-0.00013038	0.00081834	0.03	0.8734	0.000

C=0.659 SOMER DYX=0.319 GAMMA=0.322 TAU-A=0.124

Table 4.f: AUTS ORDERED LOGIT MODELS 1982 SURVEY DATA - INTERACTION
Frequency of Any Type of Ice Milk Use: CFIM

LOGISTIC REGRESSION PROCEDURE
DEPENDENT VARIABLE: CFIM

-2 LOG LIKELIHOOD FOR MODEL CONTAINING INTERCEPTS ONLY= 7158.10.
MODEL CHI-SQUARE= 55.85 WITH 22 D.F. (SCORE STAT.) P=0.0001.
CONVERGENCE IN 5 ITERATIONS WITH 0 STEP HALVINGS R= 0.040.
MAX ABSOLUTE DERIVATIVE=0.3944D-10. -2 LOG L= 7102.54.
MODEL CHI-SQUARE= 55.56 WITH 22 D.F. (-2 LOG L.R.) P=0.0001.

VARIABLE	BETA	STD. ERROR	CHI-SQUARE	P	R
ALPHA1	-0.93291287	0.71369354	1.71	0.1912	
ALPHA2	-2.46536807	0.71497690	11.89	0.0006	
ALPHA3	-5.14685476	0.72816029	49.96	0.0000	
AGEP	0.00391490	0.01491486	0.07	0.7929	0.000
IN1	0.04849330	0.18532267	0.07	0.7936	0.000
IN2	0.23422238	0.17509618	1.79	0.1810	0.000
IN3	-0.00898880	0.17314149	0.00	0.9586	0.000
IN4	-0.01054632	0.17440829	0.00	0.9518	0.000
IN5	-0.02073762	0.17727752	0.01	0.9069	0.000
IN6	-0.16457438	0.17786944	0.86	0.3548	0.000
IN7	-0.01325584	0.19776015	0.00	0.9466	0.000
IN8	-0.26663215	0.21132130	1.59	0.2070	0.000
MT	0.36827504	0.21243393	3.01	0.0830	0.012
FT	0.46251813	0.21041583	4.83	0.0279	0.020
F5	0.13126939	0.17527115	0.56	0.4539	0.000
F6_12	0.25095278	0.15497117	2.62	0.1054	0.009
AM	0.10808093	0.12521368	0.75	0.3880	0.000
HOS	0.04546388	0.02753024	2.73	0.0987	0.010
RAC	-0.45771606	0.17407167	6.91	0.0086	-0.026
LSICP	0.02327704	0.02666218	0.76	0.3826	0.000
LSICN	0.02440179	0.02153320	1.28	0.2571	0.000
LSYCA	0.01208328	0.02923331	0.17	0.6794	0.000
AAI8	-0.00012604	0.00059849	0.04	0.8332	0.000
AAI9	0.00011520	0.00047987	0.06	0.8103	0.000
AAI10	-0.00037781	0.00066852	0.32	0.5720	0.000

C=0.559 SOMER DYX=0.118 GAMMA=0.120 TAU-A=0.073

Table 4.g: AUTS ORDERED LOGIT MODELS 1982 SURVEY DATA - INTERACTION
Frequency of Any Type of Yogurt Use: CFAY

LOGISTIC REGRESSION PROCEDURE
DEPENDENT VARIABLE: CFAY

-2 LOG LIKELIHOOD FOR MODEL CONTAINING INTERCEPTS ONLY= 7750.29 .
MODEL CHI-SQUARE= 222.05 WITH 22 D.F. (SCORE STAT.) P=0.0 .
CONVERGENCE IN 5 ITERATIONS WITH 0 STEP HALVINGS R= 0.152.
MAX ABSOLUTE DERIVATIVE=0.8539D-09. -2 LOG L= 7526.58.
MODEL CHI-SQUARE= 223.71 WITH 22 D.F. (-2 LOG L.R.) P=0.0 .

VARIABLE	BETA	STD. ERROR	CHI-SQUARE	P	R
ALPHA1	-0.97328589	0.71457650	1.86	0.1732	
ALPHA2	-1.94706896	0.71528617	7.41	0.0065	
ALPHA3	-4.88995478	0.72409672	45.61	0.0000	
AGEP	-0.00319596	0.01503380	0.05	0.8317	0.000
IN1	0.00365289	0.18336381	0.00	0.9841	0.000
IN2	0.08432674	0.17379743	0.24	0.6275	0.000
IN3	-0.02458742	0.17220417	0.02	0.8865	0.000
IN4	0.14645837	0.17225784	0.72	0.3952	0.000
IN5	0.16667104	0.17680766	0.89	0.3459	0.000
IN6	0.22858027	0.17631839	1.68	0.1948	0.000
IN7	0.18581864	0.19612546	0.90	0.3434	0.000
IN8	0.63624220	0.20550724	9.58	0.0020	0.031
MT	-0.43182889	0.21252029	4.13	0.0422	-0.017
FT	0.05711331	0.21052380	0.07	0.7862	0.000
F5	-0.03231338	0.17408415	0.03	0.8527	0.000
F6_12	0.08379196	0.15280976	0.30	0.5835	0.000
AM	-0.55287383	0.12450708	19.72	0.0000	-0.048
HOS	0.02279277	0.02776284	0.67	0.4117	0.000
RAC	-0.24270949	0.16935213	2.05	0.1518	-0.003
LSICP	-0.01585832	0.02642500	0.36	0.5484	0.000
LSICN	0.09469235	0.02165569	19.12	0.0000	0.047
LSYCA	0.05997421	0.02884469	4.32	0.0376	0.017
AAI8	0.00010102	0.00059570	0.03	0.8653	0.000
AAI9	-0.00066361	0.00048529	1.87	0.1715	0.000
AAI10	0.00035926	0.00066505	0.29	0.5891	0.000

C=0.617 SOMER DYX=0.234 GAMMA=0.235 TAU-A=0.154

Table 5.a: AUTS ORDERED LOGIT MODELS 1988 SURVEY DATA - INTERACTION
Frequency of Any Type of Fluid Milk Use: CFAM

LOGISTIC REGRESSION PROCEDURE
DEPENDENT VARIABLE: CFAM

-2 LOG LIKELIHOOD FOR MODEL CONTAINING INTERCEPTS ONLY= 8260.37
MODEL CHI-SQUARE= 1137.78 WITH 22 D.F. (SCORE STAT.) P=0.0
CONVERGENCE IN 6 ITERATIONS WITH 0 STEP HALVINGS R= 0.363.
MAX ABSOLUTE DERIVATIVE=0.1069D-06. -2 LOG L= 7127.87.
MODEL CHI-SQUARE= 1132.50 WITH 22 D.F. (-2 LOG L.R.) P=0.0 .

VARIABLE	BETA	STD. ERROR	CHI-SQUARE	P	R
ALPHA1	-0.10049945	0.61719553	0.03	0.8707	
ALPHA2	-3.32026123	0.61833999	28.83	0.0000	
ALPHA3	-5.12064622	0.62262932	67.64	0.0000	
AGEP	-0.04623703	0.01228358	14.17	0.0002	-0.038
IN1	0.52983215	0.22874715	5.36	0.0205	0.020
IN2	0.34505565	0.22343033	2.39	0.1225	0.007
IN3	0.41464463	0.21967358	3.56	0.0591	0.014
IN4	0.39944433	0.21504739	3.45	0.0632	0.013
IN5	0.55011523	0.22640934	5.90	0.0151	0.022
IN6	0.32851321	0.21291290	2.38	0.1228	0.007
IN7	0.62162047	0.21756090	8.16	0.0043	0.027
IN8	0.48723108	0.21454414	5.16	0.0231	0.020
MT	0.56921086	0.20882321	7.43	0.0064	0.026
FT	0.12935975	0.20853669	0.38	0.5350	0.000
F5	0.12705611	0.16817609	0.57	0.4500	0.000
F6_12	-0.24148554	0.14869459	2.64	0.1044	-0.009
AM	0.06158375	0.12017206	0.26	0.6083	0.000
HOS	-0.01142028	0.02971598	0.15	0.7007	0.000
RAC	0.90488450	0.16656805	29.51	0.0000	0.058
LSMIR	0.14610842	0.01585097	84.96	.	0.100
LSMNA	-0.00787605	0.01863517	0.18	0.6726	0.000
AFTM	-0.22094031	0.04924678	20.13	0.0000	-0.047
AAI1	0.00081556	0.00035772	5.20	0.0226	0.020
AAI2	-0.00003674	0.00040213	0.01	0.9272	0.000
AAI3	0.00108276	0.00108838	0.99	0.3198	0.000

C=0.744 SOMER DYX=0.488 GAMMA=0.489 TAU-A=0.327

Table 5.b: AUTS ORDERED LOGIT MODELS 1988 SURVEY DATA - INTERACTION
Frequency of Regular Whole Milk Use: CFWM

LOGISTIC REGRESSION PROCEDURE
DEPENDENT VARIABLE: CFWM

-2 LOG LIKELIHOOD FOR MODEL CONTAINING INTERCEPTS ONLY= 7569.16
MODEL CHI-SQUARE= 737.71 WITH 24 D.F. (SCORE STAT.) P=0.0 .
CONVERGENCE IN 6 ITERATIONS WITH 0 STEP HALVINGS R= 0.305.
MAX ABSOLUTE DERIVATIVE=0.9055D-10. -2 LOG L= 6816.51.
MODEL CHI-SQUARE= 752.65 WITH 24 D.F. (-2 LOG L.R.) P=0.0 .

VARIABLE	BETA	STD. ERROR	CHI-SQUARE	P	R
ALPHA1	-1.97709162	0.64532864	9.39	0.0022	
ALPHA2	-4.32519686	0.65049678	44.21	0.0000	
ALPHA3	-5.65004660	0.65586461	74.21	.	
AGEP	-0.01147378	0.01342849	0.73	0.3929	0.000
IN1	0.20932537	0.22025742	0.90	0.3419	0.000
IN2	-0.34097065	0.21377856	2.54	0.1107	-0.008
IN3	-0.24773545	0.21063829	1.38	0.2395	0.000
IN4	-0.22861581	0.20555051	1.24	0.2660	0.000
IN5	-0.56103280	0.21897688	6.56	0.0104	-0.025
IN6	-0.59354649	0.20438258	8.43	0.0037	-0.029
IN7	-0.66560592	0.21067684	9.98	0.0016	-0.032
IN8	-0.63236438	0.20709819	9.32	0.0023	-0.031
MT	0.23928553	0.21417124	1.25	0.2639	0.000
FT	-0.05227144	0.21457065	0.06	0.8075	0.000
F5	0.14952999	0.17333411	0.74	0.3883	0.000
F6_12	0.07833342	0.15255640	0.26	0.6076	0.000
AM	0.29410100	0.12582535	5.46	0.0194	0.021
HOS	0.06270567	0.02969966	4.46	0.0347	0.018
RAC	-0.15749349	0.15665380	1.01	0.3147	0.000
LSMIR	0.11650305	0.01634725	50.79	0.0000	0.080
LSMNA	-0.01036176	0.01905331	0.30	0.5866	0.000
AFTM	-0.03672521	0.05020179	0.54	0.4644	0.000
LFFW	0.35193341	0.04230519	69.20	0.0000	0.094
AAI1	-0.00025819	0.00038068	0.46	0.4976	0.000
AAI2	0.00010650	0.00041697	0.07	0.7984	0.000
AAI3	-0.00069714	0.00113111	0.38	0.5377	0.000
AAI4	-0.00212925	0.00094447	5.08	0.0242	-0.020

C=0.718 SOMER DYX=0.436 GAMMA=0.438 TAU-A=0.277

Table 5.c: AUTS ORDERED LOGIT MODELS 1988 SURVEY DATA - INTERACTION
Frequency of Lowfat and Skim Milk Use: CFLS

LOGISTIC REGRESSION PROCEDURE
DEPENDENT VARIABLE: CFLS

-2 LOG LIKELIHOOD FOR MODEL CONTAINING INTERCEPTS ONLY= 8436.12.
MODEL CHI-SQUARE= 823.37 WITH 26 D.F. (SCORE STAT.) P=0.0 .
CONVERGENCE IN 6 ITERATIONS WITH 0 STEP HALVINGS R= 0.305.
MAX ABSOLUTE DERIVATIVE=0.1518D-09. -2 LOG L= 7597.39.
MODEL CHI-SQUARE= 838.73 WITH 26 D.F. (-2 LOG L.R.) P=0.0 .

VARIABLE	BETA	STD. ERROR	CHI-SQUARE	P	R
ALPHA1	-0.88019958	0.66286538	1.76	0.1842	
ALPHA2	-2.86496418	0.66437438	18.60	0.0000	
ALPHA3	-4.50917391	0.66740025	45.65	0.0000	
AGEP	-0.03894948	0.01296393	9.03	0.0027	-0.029
IN1	0.39429724	0.23137149	2.90	0.0883	0.010
IN2	0.46237497	0.22583639	4.19	0.0406	0.016
IN3	0.40900543	0.22223188	3.39	0.0657	0.013
IN4	0.53676996	0.21770150	6.08	0.0137	0.022
IN5	0.79250912	0.22865145	12.01	0.0005	0.034
IN6	0.60740133	0.21606703	7.90	0.0049	0.026
IN7	0.78294487	0.22114897	12.53	0.0004	0.035
IN8	0.81625899	0.21740649	14.10	0.0002	0.038
MT	0.33639753	0.20736774	2.63	0.1048	0.009
FT	0.22534778	0.20727460	1.18	0.2770	0.000
F5	0.26688093	0.16638099	2.57	0.1087	0.008
F6_12	-0.04314157	0.14473596	0.09	0.7656	0.000
AM	0.16101458	0.11822320	1.85	0.1732	0.000
HOS	-0.04408246	0.02925127	2.27	0.1318	-0.006
RAC	1.20553775	0.17518954	47.35	0.0000	0.073
LSMIR	0.05077723	0.01562300	10.56	0.0012	0.032
LSMNA	0.01846255	0.01881796	0.96	0.3265	0.000
LSLSS	0.08022592	0.02764226	8.42	0.0037	0.028
AFTM	-0.09962122	0.04962714	4.03	0.0447	-0.016
LFFW	-0.44705241	0.04320281	107.08	.	-0.112
AAI1	0.00069046	0.00035206	3.85	0.0499	0.015
AAI2	-0.00000871	0.00040383	0.00	0.9828	0.000
AAI3	-0.00063792	0.00108339	0.35	0.5560	0.000
AAI4	0.00390355	0.00093277	17.51	0.0000	0.043
AAI5	0.00073434	0.00059451	1.53	0.2168	0.000

C=0.721 SOMER DYX=0.442 GAMMA=0.443 TAU-A=0.309

Table 5.d: AUTS 1988 ORDERED LOGIT MODEL WITH INTERACTION TERMS
Frequency of Any Type of Cheese Use
(excluding cottage cheese): CFOC

LOGISTIC REGRESSION PROCEDURE
DEPENDENT VARIABLE: CFOC

-2 LOG LIKELIHOOD FOR MODEL CONTAINING INTERCEPTS ONLY= 5684.33
MODEL CHI-SQUARE= 319.81 WITH 20 D.F. (SCORE STAT.) P=0.0 .
CONVERGENCE IN 6 ITERATIONS WITH 0 STEP HALVINGS R= 0.224.
MAX ABSOLUTE DERIVATIVE=0.3669D-10. -2 LOG L= 5359.19.
MODEL CHI-SQUARE= 325.14 WITH 20 D.F. (-2 LOG L.R.) P=0.0 .

VARIABLE	BETA	STD. ERROR	CHI-SQUARE	P	R
ALPHA1	-2.07167415	0.71560886	8.38	0.0038	
ALPHA2	-2.73239745	0.71478823	14.61	0.0001	
ALPHA3	-6.90995602	0.72782140	90.14	.	
AGEP	0.01424743	0.01443151	0.97	0.3235	0.000
IN1	0.31944268	0.25617098	1.55	0.2124	0.000
IN2	0.33270834	0.24785833	1.80	0.1795	0.000
IN3	0.54612774	0.24329607	5.04	0.0248	0.023
IN4	0.50045349	0.23932434	4.37	0.0365	0.020
IN5	0.38418274	0.25293914	2.31	0.1288	0.007
IN6	0.52724576	0.23742257	4.93	0.0264	0.023
IN7	0.43522700	0.24419090	3.18	0.0747	0.014
IN8	0.60359440	0.24045663	6.30	0.0121	0.028
MT	0.28391342	0.23650050	1.44	0.2300	0.000
FT	0.18753028	0.23399225	0.64	0.4229	0.000
F5	0.58851866	0.19042687	9.55	0.0020	0.036
F6_12	0.35953907	0.16772076	4.60	0.0321	0.021
AM	0.30413081	0.13762233	4.88	0.0271	0.023
HOS	-0.03642469	0.03311015	1.21	0.2713	0.000
RAC	1.09309925	0.19094529	32.77	0.0000	0.074
LSCPA	0.36064103	0.04914991	53.84	0.0000	0.095
LSCNA	0.01855225	0.02091106	0.79	0.3750	0.000
AAI6	-0.00001052	0.00110971	0.00	0.9924	0.000
AAI7	-0.00125054	0.00044648	7.84	0.0051	-0.032

C=0.672 SOMER DYX=0.344 GAMMA=0.351 TAU-A=0.153

Table 5.e: AUTS ORDERED LOGIT MODELS 1988 DATA WITH INTERACTION TERMS
Frequency of Any Type of Ice Cream Use: CFIC

LOGISTIC REGRESSION PROCEDURE
DEPENDENT VARIABLE: CFIC

-2 LOG LIKELIHOOD FOR MODEL CONTAINING INTERCEPTS ONLY= 5724.45
MODEL CHI-SQUARE= 272.89 WITH 22 D.F. (SCORE STAT.) P=0.0 .
CONVERGENCE IN 6 ITERATIONS WITH 0 STEP HALVINGS R= 0.196.
MAX ABSOLUTE DERIVATIVE=0.4191D-10. -2 LOG L= 5461.55.
MODEL CHI-SQUARE= 262.90 WITH 22 D.F. (-2 LOG L.R.) P=0.0 .

VARIABLE	BETA	STD. ERROR	CHI-SQUARE	P	R
ALPHA1	1.30636288	0.82851184	2.49	0.1149	
ALPHA2	0.03515477	0.82632973	0.00	0.9661	
ALPHA3	-4.25252084	0.83368647	26.02	0.0000	
AGEP	-0.02711618	0.01632263	2.76	0.0967	-0.012
IN1	-0.79517760	0.26290514	9.15	0.0025	-0.035
IN2	-0.74702709	0.25350707	8.68	0.0032	-0.034
IN3	-0.55375931	0.24908407	4.94	0.0262	-0.023
IN4	-0.61866099	0.24553572	6.35	0.0117	-0.028
IN5	-0.66594381	0.25961454	6.58	0.0103	-0.028
IN6	-0.57279144	0.24381956	5.52	0.0188	-0.025
IN7	-0.52578108	0.25057143	4.40	0.0359	-0.020
IN8	-0.43339715	0.24652672	3.09	0.0787	-0.014
MT	0.44376964	0.24630378	3.25	0.0716	0.015
FT	0.63635815	0.24556934	6.72	0.0096	0.029
F5	-0.02582971	0.19461884	0.02	0.8944	0.000
F6_12	0.02544180	0.16971106	0.02	0.8808	0.000
AM	0.17531504	0.13828541	1.61	0.2049	0.000
HOS	0.08088133	0.03505545	5.32	0.0210	0.024
RAC	0.55320484	0.18514217	8.93	0.0028	0.035
LSICP	0.10066201	0.03148956	10.22	0.0014	0.038
LSICN	-0.01297192	0.02488252	0.27	0.6021	0.000
LSYCA	-0.04499028	0.03813087	1.39	0.2380	0.000
AAI8	0.00146032	0.00068019	4.61	0.0318	0.021
AAI9	-0.00063963	0.00053230	1.44	0.2295	0.000
AAI10	0.00039113	0.00082665	0.22	0.6361	0.000

C=0.657 SOMER DYX=0.313 GAMMA=0.315 TAU-A=0.134

Table 5.f: AUTS ORDERED LOGIT MODELS 1988 DATA WITH INTERACTION TERMS
Frequency of Any Type of Ice Milk Use: CFIM

LOGISTIC REGRESSION PROCEDURE
DEPENDENT VARIABLE: CFIM

-2 LOG LIKELIHOOD FOR MODEL CONTAINING INTERCEPTS ONLY= 7635.75 .
MODEL CHI-SQUARE= 60.38 WITH 22 D.F. (SCORE STAT.) P=0.0000.
CONVERGENCE IN 5 ITERATIONS WITH 0 STEP HALVINGS R= 0.046.
MAX ABSOLUTE DERIVATIVE=0.3682D-10. -2 LOG L= 7575.39.
MODEL CHI-SQUARE= 60.36 WITH 22 D.F. (-2 LOG L.R.) P=0.0000.

VARIABLE	BETA	STD. ERROR	CHI-SQUARE	P	R
ALPHA1	-0.30594393	0.69623008	0.19	0.6604	
ALPHA2	-1.73442389	0.69680389	6.20	0.0128	
ALPHA3	-4.14836364	0.70450161	34.67	0.0000	
AGEP	0.00368915	0.01413375	0.07	0.7941	0.000
IN1	-0.04348415	0.21647296	0.04	0.8408	0.000
IN2	-0.01822023	0.20909929	0.01	0.9306	0.000
IN3	-0.07270620	0.20547406	0.13	0.7235	0.000
IN4	0.00598099	0.20227381	0.00	0.9764	0.000
IN5	-0.10140024	0.21272225	0.23	0.6336	0.000
IN6	-0.17118979	0.20087477	0.73	0.3941	0.000
IN7	-0.11240623	0.20587082	0.30	0.5851	0.000
IN8	-0.29297928	0.20339153	2.07	0.1497	-0.003
MT	0.37983469	0.20441428	3.45	0.0631	0.014
FT	0.45123504	0.20275998	4.95	0.0261	0.020
F5	0.22666313	0.16250736	1.95	0.1631	0.000
F6_12	0.24696350	0.14218034	3.02	0.0824	0.012
AM	0.02692150	0.11783700	0.05	0.8193	0.000
HOS	0.07432928	0.02838225	6.86	0.0088	0.025
RAC	-0.28287642	0.15526350	3.32	0.0685	-0.013
LSICP	0.02252741	0.02657233	0.72	0.3966	0.000
LSICN	0.00945974	0.02033275	0.22	0.6418	0.000
LSYCA	-0.03262722	0.03070866	1.13	0.2880	0.000
AAI8	-0.00066685	0.00059215	1.27	0.2601	0.000
AAI9	0.00031574	0.00044213	0.51	0.4751	0.000
AAI10	0.00061405	0.00066938	0.84	0.3590	0.000

C=0.561 SOMER DYX=0.122 GAMMA=0.123 TAU-A=0.079

Table 5.g: AUTS ORDERED LOGIT MODELS 1988 DATA WITH INTERACTION TERMS
Frequency of Any Type of Yogurt Use: CFAY

LOGISTIC REGRESSION PROCEDURE
DEPENDENT VARIABLE: CFAY

-2 LOG LIKELIHOOD FOR MODEL CONTAINING INTERCEPTS ONLY= 8072.74.
MODEL CHI-SQUARE= 274.33 WITH 22 D.F. (SCORE STAT.) P=0.0 .
CONVERGENCE IN 5 ITERATIONS WITH 0 STEP HALVINGS R= 0.169.
MAX ABSOLUTE DERIVATIVE=0.1555D-07. -2 LOG L= 7797.24.
MODEL CHI-SQUARE= 275.50 WITH 22 D.F. (-2 LOG L.R.) P=0.0 .

VARIABLE	BETA	STD. ERROR	CHI-SQUARE	P	R
ALPHA1	0.23614565	0.67747766	0.12	0.7274	
ALPHA2	-0.80081246	0.67765799	1.40	0.2373	
ALPHA3	-3.87088415	0.68442873	31.99	0.0000	
AGEP	-0.03053251	0.01384049	4.87	0.0274	-0.019
IN1	0.26604915	0.21658957	1.51	0.2193	0.000
IN2	0.26914460	0.20845026	1.67	0.1966	0.000
IN3	0.38030339	0.20541654	3.43	0.0641	0.013
IN4	0.40477982	0.20177836	4.02	0.0448	0.016
IN5	0.51780778	0.21276410	5.92	0.0149	0.022
IN6	0.47440583	0.20085032	5.58	0.0182	0.021
IN7	0.53463848	0.20536320	6.78	0.0092	0.024
IN8	0.88738312	0.20312707	19.08	0.0000	0.046
MT	-0.09255800	0.20167816	0.21	0.6463	0.000
FT	0.36634237	0.20070646	3.33	0.0680	0.013
F5	0.59179067	0.16242955	13.27	0.0003	0.037
F6_12	0.39325019	0.14138840	7.74	0.0054	0.027
AM	-0.33888510	0.11570294	8.58	0.0034	-0.029
HOS	-0.02130119	0.02858452	0.56	0.4562	0.000
RAC	0.38177920	0.15432506	6.12	0.0134	0.023
LSICP	-0.03170274	0.02621128	1.46	0.2265	0.000
LSICN	0.01219461	0.02042056	0.36	0.5504	0.000
LSYCA	0.05057381	0.03099484	2.66	0.1027	0.009
AAI8	0.00006349	0.00058248	0.01	0.9132	0.000
AAI9	0.00058558	0.00044054	1.77	0.1838	0.000
AAI10	0.00120957	0.00067847	3.18	0.0746	0.012

C=0.627 SOMER DYX=0.254 GAMMA=0.255 TAU-A=0.172

Table 6.a. A comparison of the Ordinal Logit models estimated for each year 1976 - 1982 - 1988.

Dairy Product: Any type of Fluid Milk beverage.

Variable	1988		1982		1976	
ALPHA1	0.904386		0.464551		0.649638	
ALPHA2	0.036143		0.117002		0.092979	
ALPHA3	0.005972		0.034343		0.024824	
AGEP	0.954816	**	0.985551		0.971514	**
IN1	1.698647	**	0.888935		2.032078	**
IN2	1.412068		0.954783		1.542153	**
IN3	1.513833	**	0.900809		1.501711	
IN4	1.490996	**	0.970532		1.77455	**
IN5	1.733453	**	0.93906		1.774715	**
IN6	1.388902		0.971253		1.796327	**
IN7	1.861943	**	0.936116		1.910547	**
IN8	1.627803	**	0.838755		1.839942	**
MT	1.766872	**	1.72612	**	2.975221	**
FT	1.138099		1.475219	**	1.550384	**
F5	1.135481		1.267134		0.933021	
F6_12	0.78546		0.838313		0.908143	
AM	1.06352		1.254289	**	1.82916	**
HOS	0.988645		1.027104		1.036016	
RAC	2.471646	**	1.401771	**	1.501029	**
LSMIR	1.157322	**	1.080977	**	1.079782	**
LSMNA	0.992155		0.990637		0.976369	
AFTM	0.801765	**	0.924994	**	0.90236	**
AAI1	1.000816	**	0.999855		1.000305	
AAI2	0.999963		0.999835		1.000312	
AAI3	1.001083		1.001135		1.000241	

The logit equation is expressed as: $odds = \exp \sum_{i-1}^{k} \beta_i$

A parameter greater that one expresses a likelihood greater than one relative to the omitted reference point.

** denotes a variable which is statistically significant at +0.10 or smaller.

Table 6.b. A comparison of the Ordinal Logit models estimated for each year 1976 - 1982 - 1988.

Dairy Product: Regular Whole Fluid Milk beverage.

Variable	1988	1982	1976
ALPHA1	0.138471	0.014784	0.188785
ALPHA2	0.013231	0.001925	0.019534
ALPHA3	0.003517	0.000392	0.00558
AGEP	0.988592	1.027956 **	0.974684 **
IN1	1.232846	1.258021	2.62292 **
IN2	0.71108	0.879658	1.990681 **
IN3	0.780566	0.798124	1.874117 **
IN4	0.795634	0.803261	2.085162 **
IN5	0.570619 **	0.825095	1.822922 **
IN6	0.552365 **	0.80915	1.625459 **
IN7	0.513962 **	0.831752	2.000506 **
IN8	0.531334 **	0.878364	1.782933 **
MT	1.270341	1.780795 **	2.918468 **
FT	0.949071	1.195787	1.433626 **
F5	1.161288	1.214624	1.068352
F6_12	1.081483	0.95425	1.166379
AM	1.341919 **	1.525026 **	2.410251 **
HOS	1.064713 **	1.042631	1.00529
RAC	0.854282	1.159687	1.066285
LSMIR	1.123561 **	1.179015 **	1.103868 **
LSMNA	0.989692	1.035096 **	0.999735
AFTM	0.963941	1.03836	0.897316 **
LFFW	1.421814 **	1.427935 **	1.232531 **
AAI1	0.999742	0.999146 **	1.000107
AAI2	1.000107	0.998605 **	0.99976
AAI3	0.999303	0.998011 **	1.000431
AAI4	0.997873 **	0.998045 **	0.99978

The logit equation is expressed as: $odds = \exp^{\sum_{i-1}^{k} \beta_i}$

A parameter greater that one expresses a likelihood greater than one relative to the omitted reference point.

** denotes a variable which is statistically significant at +0.10 or smaller.

Table 6.c. A comparison of the Ordinal Logit model estimated for the years 1976 - 1982 - 1988

Dairy product: Lowfat and Skim Milk beverage.

Variable	1988		1982		1976	
ALPHA1	0.4147		1.200883		0.172519	
ALPHA2	0.056985		0.249959		0.029939	
ALPHA3	0.011008		0.051089		0.009597	
AGEP	0.961799	**	0.94002	**	0.985223	
IN1	1.483341	**	1.070591		0.986208	
IN2	1.587841	**	1.146897		0.954413	
IN3	1.50532	**	1.581345	**	0.958677	
IN4	1.710473	**	1.547584	**	1.400361	
IN5	2.208932	**	1.675481	**	1.153398	
IN6	1.835655	**	1.675038	**	1.364023	
IN7	2.187906	**	1.501057	**	1.39401	
IN8	2.262022	**	1.478933	**	1.538173	
MT	1.399895		0.876679		1.034268	
FT	1.252758		0.920044		1.171272	
F5	1.305885		1.165988		1.302392	
F6_12	0.957776		0.691693	**	1.141729	
AM	1.174702		0.948409		1.524688	**
HOS	0.956875		0.995598		0.96225	
RAC	3.338554	**	1.774474	**	1.950525	**
LSMIR	1.052088	**	1.063634	**	1.069806	**
LSMNA	1.018634		0.965179	**	1.000725	
LSLSS	1.083532	**	1.087049	**	1.144327	**
AFTM	0.90518	**	0.947741		0.949157	
LFFW	0.63951	**	0.644492	**	0.756837	**
AAI1	1.000691	**	1.000943	**	1.000189	
AAI2	0.999991		1.001185	**	1.000302	
AAI3	0.999362		1.001117		1.0003	
AAI4	1.003911	**	1.002151	**	0.999401	

The logit equation is expressed as: $odds = \exp \sum_{i-1}^{k} \beta_i$

A parameter greater that one expresses a likelihood greater than one relative to the omitted reference point.

** denotes a variable which is statistically significant at +0.10 or smaller.

Table 6.d. A comparison of the Ordinal Logit model estimated for the years 1976 - 1982 - 1988

Dairy product: Any type of Cheese {except cottage}.

Variable	1988		1982		1976	
ALPHA1	0.125975		0.313001		1.257723	
ALPHA2	0.065063		0.212272		0.831763	
ALPHA3	0.000998		0.004811		0.022014	
AGEP	1.014349		0.99507		0.997908	
IN1	1.37636		0.985052		1.16979	
IN2	1.39474		1.30384		1.351637	
IN3	1.726554	**	1.465687	**	1.58971	
IN4	1.649469	**	1.51324	**	2.027719	**
IN5	1.468414		1.614128	**	2.247249	**
IN6	1.694259	**	1.621316	**	1.904856	**
IN7	1.545314	**	1.842623	**	2.789442	**
IN8	1.82868	**	1.76679	**	2.483346	**
MT	1.328318		0.527608	**	0.878385	
FT	1.206267		0.575257	**	0.931156	
F5	1.801318	**	1.11013		1.098563	
F6_12	1.432669	**	1.008579		1.409899	**
AM	1.355446	**	0.979055		1.354765	**
HOS	0.964231		1.043779		0.928966	**
RAC	2.983506	**	2.126664	**	2.063928	**
LSCPA	1.434249	**	1.42266	**	1.284952	**
LSCNA	1.018725		0.982468		1.019736	
AAI6	0.999989		0.998757		1.000793	
AAI7	0.99875	**	1.000043		0.999058	**

The logit equation is expressed as: $odds = \exp \sum_{i=1}^{k} \beta_i$

A parameter greater that one expresses a likelihood greater than one relative to the omitted reference point.

** denotes a variable which is statistically significant at +0.10 or smaller.

Table 6.e. A comparison of the Ordinal Logit model estimated for the years 1976 - 1982 - 1988

Dairy product: Any type of Ice Cream.

Variable	1988		1982		1976	
ALPHA1	3.692718		0.404132		7.725175	
ALPHA2	1.03578		0.111204		2.415001	
ALPHA3	0.014228		0.001259		0.050574	
AGEP	0.973248	**	1.008095		0.998557	
IN1	0.451501	**	1.154519		1.193935	
IN2	0.473773	**	1.229037		1.643695	**
IN3	0.574785	**	1.360659		1.443141	
IN4	0.538665	**	1.356885		2.005899	**
IN5	0.513788	**	1.371005		1.911246	**
IN6	0.563949	**	1.458873	**	2.25884	**
IN7	0.591093	**	2.036916	**	2.046149	**
IN8	0.648303	**	1.750979	**	1.883817	**
MT	1.558571	**	2.475855	**	1.854978	**
FT	1.889587	**	2.028209	**	1.568471	**
F5	0.974501		1.544755	**	1.173628	
F6_12	1.025768		1.725738	**	1.134028	
AM	1.191622		1.434439	**	1.036327	
HOS	1.084242	**	1.03292		1.124936	**
RAC	1.738817	**	1.397676		0.912123	
LSICP	1.105903	**	1.155761	**		
LSICN	0.987112		0.990242			
LSYCA	0.956007		1.011192			
AAI8	1.001461	**	1.000235			
AAI9	0.999361		0.999329			
AAI10	1.000391		0.99987			

The logit equation is expressed as: $odds = \exp \sum_{i=1}^{k} \beta_i$

A parameter greater that one expresses a likelihood greater than one relative to the omitted reference point.

** denotes a variable which is statistically significant at +0.10 or smaller.

Table 6.f. A comparison of the Ordinal Logit model estimated for the years 1976 - 1982 - 1988

Dairy product: Any type of Ice Milk.

Variable	1988		1982		1976	
ALPHA1	0.736428		0.393406		1.374583	
ALPHA2	0.176502		0.084978		0.428911	
ALPHA3	0.01579		0.005818		0.029212	
AGEP	1.003696		1.003923		0.99722	
IN1	0.957448		1.049688		1.320818	
IN2	0.981945		1.263926		1.072296	
IN3	0.929874		0.991051		0.983318	
IN4	1.005999		0.989509		0.899967	
IN5	0.903571		0.979476		0.92945	
IN6	0.842662		0.848255		0.924675	
IN7	0.893681		0.986832		0.671712	
IN8	0.746038		0.765955		0.725843	
MT	1.462043	**	1.445239	**	1.523327	**
FT	1.57025	**	1.588068	**	1.24675	
F5	1.254407		1.140275		1.00626	
F6_12	1.280132	**	1.285249		1.073957	
AM	1.027287		1.114138		0.971813	
HOS	1.077161	**	1.046513	**	1.100953	**
RAC	0.753613	**	0.632727	**	0.801033	
LSICP	1.022783		1.02355			
LSICN	1.009505		1.024702			
LSYCA	0.967899		1.012157			
AAI8	0.999333		0.999874			
AAI9	1.000316		1.000115			
AAI10	1.000614		0.999622			

The logit equation is expressed as: $odds = \exp \sum_{i-1}^{k} \beta_i$

A parameter greater that one expresses a likelihood greater than one relative to the omitted reference point.

** denotes a variable which is statistically significant at +0.10 or smaller.

Table 6.g. A comparison of the Ordinal Logit model estimated for the years 1976 - 1982 - 1988

Dairy product: Any type of Yogurt.

Variable	1988		1982		1976	
ALPHA1	1.266359		0.377839		0.683548	
ALPHA2	0.448964		0.142692		0.273092	
ALPHA3	0.02084		0.007522		0.024253	
AGEP	0.969929	**	0.996809		0.998429	
IN1	1.304799		1.00366		1.224804	
IN2	1.308844		1.087984		1.099585	
IN3	1.462728	**	0.975712		1.166766	
IN4	1.498972	**	1.157727		1.330429	
IN5	1.678344	**	1.181366		1.427618	
IN6	1.607059	**	1.256814		1.551545	**
IN7	1.706831	**	1.204204		1.255248	
IN8	2.428766	**	1.889368	**	1.692095	**
MT	0.911596		0.64932	**	0.998176	
FT	1.442449	**	1.058776		1.147527	
F5	1.807222	**	0.968203		1.138612	
F6_12	1.481789	**	1.087403		1.1051	
AM	0.712564	**	0.575294	**	0.730359	**
HOS	0.978924		1.023055		1.009073	
RAC	1.464889	**	0.784499		0.935428	
LSICP	0.968795		0.984267			
LSICN	1.012269		1.099321	**		
LSYCA	1.051874	**	1.061809	**		
AAI8	1.000063		1.000101			
AAI9	1.000586		0.999337			
AAI10	1.00121	**	1.000359			

The logit equation is expressed as: $odds = \exp \sum_{i-1}^{k} \beta_i$

A parameter greater that one expresses a likelihood greater than one relative to the omitted reference point.

** denotes a variable which is statistically significant at +0.10 or smaller.

Table 7.a: Comparison of estimated parameters over the sample time frame 1976 - 1982
Frequency of use for: CFAM

	b88-b82	Std Err	Asymt-T		b82-b76	Std Err	Asymt-T
ALPHA1	0.666185	0.845872	0.787571	ALPHA1	-0.33534	0.85318	0.393051
ALPHA2	-1.1747	0.847379	1.386272	ALPHA2	0.229822	0.854932	0.26882
ALPHA3	-1.74929	0.852698	2.051474**	ALPHA3	0.324605	0.858912	0.377926
AGEP	-0.03168	0.016777	1.88847	AGEP	0.014346	0.016371	0.876269
IN1	0.647564	0.290254	2.231026**	IN1	-0.82679	0.38218	2.163355**
IN2	0.391326	0.281101	1.392118	IN2	-0.47945	0.319633	1.500002
IN3	0.519106	0.276233	1.879233	IN3	-0.51107	0.322765	1.583402
IN4	0.429355	0.273228	1.571417	IN4	-0.60346	0.320176	1.884767
IN5	0.612991	0.284301	2.156135**	IN5	-0.63652	0.319349	1.993167
IN6	0.357681	0.273167	1.309386	IN6	-0.61491	0.321408	1.913182
IN7	0.687636	0.290816	2.364506**	IN7	-0.71341	0.338787	2.105762**
IN8	0.663068	0.297849	2.226189**	IN8	-0.78557	0.336363	2.335487**
MT	0.023335	0.293004	0.079639	MT	-0.54444	0.285171	1.90918
FT	-0.25945	0.290027	0.89456	FT	-0.0497	0.277515	0.179075
F5	-0.1097	0.237154	0.462575	F5	0.306085	0.227948	1.342781
F6_12	-0.06512	0.209917	0.310227	F6_12	-0.08001	0.207931	0.384795
AM	-0.16498	0.167685	0.983897	AM	-0.37729	0.15601	2.418353**
HOS	-0.03816	0.040018	0.953668	HOS	-0.00864	0.038113	0.226678
RAC	0.567148	0.2386	2.376983**	RAC	-0.06841	0.240553	0.284405
LSMIR	0.068243	0.021807	3.129391**	LSMIR	0.001106	0.021712	0.050925
LSMNA	0.001531	0.026538	0.05769	LSMNA	0.014508	0.026102	0.555811
AFTM	-0.14297	0.068334	2.092246**	AFTM	0.024773	0.065541	0.377985
AAI1	0.000961	0.000492	1.952586	AAI1	-0.00045	0.000482	0.933522
AAI2	0.000128	0.000571	0.224959	AAI2	-0.00048	0.000549	0.869164
AAI3	-5.2E-05	0.001501	0.034535	AAI3	0.000894	0.001419	0.629947

** statistically significant difference at the 0.10 level.

Table 7.b: Comparison of estimated parameters over the sample time frame 1976 - 1982
Frequency of use for: CFWM

	b88-b82	Std Err	Asymt-T		b82-b76	Std Err	Asymt-T
ALPHA1	2.237144	0.902987	2.477494**	ALPHA1	-2.54709	0.914531	2.785131**
ALPHA2	1.927867	0.910313	2.117806**	ALPHA2	-2.31746	0.920382	2.517936**
ALPHA3	2.195165	0.91943	2.387527**	ALPHA3	-2.65659	0.928271	2.861866**
AGEP	-0.03905	0.018426	2.119101**	AGEP	0.053215	0.017899	2.973009**
IN1	-0.02021	0.287283	0.070365	IN1	-0.73475	0.388375	1.891853
IN2	-0.21275	0.277395	0.766952	IN2	-0.8167	0.325404	2.509798**
IN3	-0.02224	0.273315	0.081388	IN3	-0.85363	0.32839	2.599433**
IN4	-0.00954	0.270513	0.035268	IN4	-0.95392	0.326382	2.922721**
IN5	-0.36878	0.282602	1.304933	IN5	-0.7927	0.324519	2.442683**
IN6	-0.38178	0.27139	1.406742	IN6	-0.69756	0.327402	2.130596**
IN7	-0.48139	0.291243	1.652866	IN7	-0.87762	0.345162	2.542632**
IN8	-0.50267	0.296545	1.695091	IN8	-0.70795	0.341693	2.071903**
MT	-0.33777	0.299965	1.126047	MT	-0.494	0.292146	1.690932
FT	-0.23108	0.298764	0.77344	FT	-0.1814	0.286696	0.632737
F5	-0.0449	0.2444	0.183733	F5	0.128317	0.235156	0.545668
F6_12	0.125163	0.216734	0.577498	F6_12	-0.20073	0.216775	0.926002
AM	-0.12791	0.175054	0.730691	AM	-0.45772	0.163863	2.793313**
HOS	0.020958	0.040731	0.514539	HOS	0.036471	0.039463	0.92418
RAC	-0.30564	0.235355	1.29865	RAC	0.08397	0.245734	0.34171
LSMIR	-0.04818	0.022968	2.0975**	LSMIR	0.065859	0.023073	2.854375**
LSMNA	-0.04486	0.027121	1.653886	LSMNA	0.034759	0.026829	1.295559
AFTM	-0.07437	0.070001	1.062382	AFTM	0.145989	0.067336	2.168074**
LFFW	-0.0043	0.05875	0.073121	LFFW	0.147159	0.057745	2.548438**
AAI1	0.000596	0.000525	1.135724	AAI1	-0.00096	0.000514	1.869991
AAI2	0.001502	0.00059	2.545424**	AAI2	-0.00116	0.000572	2.022445**
AAI3	0.001294	0.001566	0.826139	AAI3	-0.00242	0.001485	1.630445
AAI4	-0.00017	0.001313	0.131522	AAI4	-0.00174	0.001276	1.361031

** statistically significant difference at the 0.10 level.

Table 7.c: Comparison of estimated parameters over the sample time frame 1976 - 1982
Frequency of use for: CFLS

	b88-b82	Std Err	Asymt-T		b82-b76	Std Err	Asymt-T
ALPHA1	-1.06326	0.946935	1.122841	ALPHA1	1.940306	0.995422	1.949229
ALPHA2	-1.47851	0.948049	1.559525	ALPHA2	2.122151	0.996873	2.128808**
ALPHA3	-1.53499	0.9518	1.612726	ALPHA3	1.67212	1.000149	1.671871
AGEP	0.022904	0.019054	1.202095	AGEP	-0.04697	0.019655	2.389543**
IN1	0.326087	0.299544	1.088612	IN1	0.082098	0.408465	0.200993
IN2	0.325315	0.289847	1.122368	IN2	0.183719	0.339494	0.541156
IN3	-0.04927	0.285382	0.172646	IN3	0.500476	0.343208	1.458229
IN4	0.100075	0.282923	0.353718	IN4	0.099965	0.340844	0.293286
IN5	0.276409	0.292992	0.943401	IN5	0.373388	0.339209	1.100762
IN6	0.091565	0.282975	0.32358	IN6	0.205398	0.340981	0.602374
IN7	0.376776	0.300747	1.252798	IN7	0.073985	0.358994	0.20609
IN8	0.424938	0.304829	1.394019	IN8	-0.03927	0.353412	0.11113
MT	0.468012	0.298489	1.567937	MT	-0.16531	0.299509	0.551933
FT	0.308682	0.295222	1.045594	FT	-0.24142	0.293209	0.823387
F5	0.113312	0.239045	0.474019	F5	-0.11063	0.237337	0.466144
F6_12	0.325471	0.209825	1.551153	F6_12	-0.50116	0.217239	2.306937**
AM	0.213984	0.16896	1.266475	AM	-0.47476	0.164863	2.879714**
HOS	-0.03967	0.040598	0.977165	HOS	0.03407	0.040148	0.848616
RAC	0.632034	0.252446	2.503638**	RAC	-0.09459	0.264354	0.357832
LSMIR	-0.01091	0.022565	0.483656	LSMIR	-0.00579	0.023883	0.242278
LSMNA	0.053905	0.027363	1.969989	LSMNA	-0.03617	0.027825	1.29978
LSLSS	-0.00324	0.039126	0.082827	LSLSS	-0.05135	0.03804	1.349912
AFTM	-0.04595	0.070282	0.65375	AFTM	-0.00149	0.069337	0.021528
LFFW	-0.00776	0.061035	0.127139	LFFW	-0.16068	0.061151	2.627664**
AAI1	-0.00025	0.000514	0.490419	AAI1	0.000753	0.00054	1.396187
AAI2	-0.00119	0.000587	2.034401**	AAI2	0.000883	0.000589	1.499766
AAI3	-0.00175	0.001536	1.142546	AAI3	0.000816	0.001514	0.539021
AAI4	0.001755	0.001331	1.318189	AAI4	0.002748	0.001339	2.052763**
AAI5	0.000319	0.000845	0.377354	AAI5	0.001036	0.000806	1.286029

** statistically significant difference at the 0.10 level.

Table 7.d: Comparison of estimated parameters over the sample time frame 1976 - 1982
Frequency of use for: CFOC

	b88-b82	Std Err	Asymt-T		b82-b76	Std Err	Asymt-T
ALPHA1	-0.91013	0.993442	0.916133	ALPHA1	-1.39085	0.966311	1.439341
ALPHA2	-1.18251	0.992713	1.191193	ALPHA2	-1.36568	0.96576	1.414096
ALPHA3	-1.57309	1.008026	1.56057	ALPHA3	-1.5208	0.975531	1.558951
AGEP	0.01919	0.020202	0.949919	AGEP	-0.00285	0.01946	0.14636
IN1	0.334503	0.327724	1.020688	IN1	-0.17188	0.407893	0.421397
IN2	0.067394	0.314161	0.214522	IN2	-0.036	0.338378	0.106397
IN3	0.163804	0.308737	0.530562	IN3	-0.08123	0.343565	0.236426
IN4	0.086201	0.306944	0.280835	IN4	-0.29266	0.341636	0.856639
IN5	-0.09461	0.319777	0.295869	IN5	-0.33091	0.340075	0.973055
IN6	0.044007	0.307902	0.142927	IN6	-0.16117	0.341978	0.471282
IN7	-0.17596	0.326907	0.538267	IN7	-0.41465	0.362254	1.144645
IN8	0.03443	0.333599	0.103209	IN8	-0.34044	0.357445	0.952433
MT	0.923316	0.333323	2.770032**	MT	-0.50973	0.320916	1.588365
FT	0.740468	0.329936	2.244279**	FT	-0.48161	0.316244	1.522904
F5	0.484041	0.270225	1.791252	F5	0.010474	0.260135	0.040264
F6_12	0.350996	0.238322	1.472781	F6_12	-0.33498	0.238017	1.407362
AM	0.325298	0.193383	1.682139	AM	-0.3248	0.18032	1.801215
HOS	-0.07927	0.045143	1.756034	HOS	0.116531	0.04311	2.703134**
RAC	0.338545	0.272637	1.241741	RAC	0.029943	0.266073	0.112538
LSCPA	0.008113	0.068606	0.118253	LSCPA	0.101807	0.100438	1.013624
LSCNA	0.03624	0.030514	1.187619	LSCNA	-0.03723	0.030986	1.201531
AAI6	0.001233	0.00155	0.795509	AAI6	-0.00204	0.002245	0.90705
AAI7	-0.00129	0.000654	1.979385	AAI7	0.000986	0.000653	1.508982

** statistically significant difference at the 0.10 level.

Table 7.e: Comparison of estimated parameters over the sample time frame 1976 - 1982
Frequency of use for: CFIC

	b88-b82	Std Err	Asymt-T		b82-b76	Std Err	Asymt-T
ALPHA1	2.212376	1.200097	1.843497	ALPHA1	-2.9505	0.946528	3.117179**
ALPHA2	2.231544	1.197565	1.863401	ALPHA2	-3.07809	0.943412	3.262719**
ALPHA3	2.424687	1.212599	1.999579	ALPHA3	-3.6929	0.957894	3.855226**
AGEP	-0.03518	0.023984	1.466749	AGEP	0.009506	0.017935	0.530039
IN1	-0.93886	0.341827	2.746597**	IN1	-0.03357	0.396873	0.084588
IN2	-0.95326	0.327888	2.907273**	IN2	-0.29072	0.335627	0.866187
IN3	-0.86173	0.322947	2.668332**	IN3	-0.05885	0.340438	0.172873
IN4	-0.92385	0.321537	2.87324**	IN4	-0.3909	0.340096	1.149384
IN5	-0.98149	0.335309	2.92711**	IN5	-0.33221	0.338979	0.980035
IN6	-0.95046	0.323734	2.935911**	IN6	-0.43719	0.341776	1.279164
IN7	-1.23722	0.349563	3.539325**	IN7	-0.00452	0.370088	0.01222
IN8	-0.99357	0.356613	2.786136**	IN8	-0.07312	0.364812	0.200445
MT	-0.46282	0.360658	1.283254	MT	0.288713	0.343253	0.841107
FT	-0.0708	0.357955	0.197777	FT	0.257052	0.338574	0.75922
F5	-0.46069	0.28858	1.596422	F5	0.274765	0.277736	0.989302
F6_12	-0.52021	0.255262	2.037954**	F6_12	0.419879	0.255803	1.641419
AM	-0.18546	0.203455	0.911551	AM	0.325092	0.190001	1.711003
HOS	0.048492	0.049592	0.977818	HOS	-0.08534	0.046676	1.828264
RAC	0.218394	0.283517	0.770303	RAC	0.426791	0.280693	1.520491
LSICP	-0.0441	0.044946	0.981112	LSICP			
LSICN	-0.00317	0.036628	0.086424	LSICN			
LSYCA	-0.05612	0.052815	1.062571	LSYCA			
AAI8	0.001225	0.000967	1.267817	AAI8			
AAI9	3.15E-05	0.000793	0.03972	AAI9			
AAI10	0.000522	0.001163	0.448341	AAI10			

** statistically significant difference at the 0.10 level.

Table 7.g: Comparison of estimated parameters over the sample time frame 1976 - 1982
Frequency of use for: CFAY

	b88-b82	Std Err	Asymt-T		b82-b76	Std Err	Asymt-T
ALPHA1	1.209432	0.98468	1.228248	ALPHA1	-0.59283	0.788296	0.752037
ALPHA2	1.146257	0.98532	1.163335	ALPHA2	-0.64912	0.789226	0.822482
ALPHA3	1.019071	0.996373	1.02278	ALPHA3	-1.17076	0.802631	1.458651
AGEP	-0.02734	0.020435	1.337756	AGEP	-0.00162	0.015382	0.105583
IN1	0.262396	0.283784	0.924634	IN1	-0.19913	0.352591	0.564757
IN2	0.184818	0.271398	0.680984	IN2	-0.01061	0.298306	0.035553
IN3	0.404891	0.268049	1.510511	IN3	-0.17882	0.302351	0.591442
IN4	0.258321	0.265306	0.973674	IN4	-0.13904	0.299867	0.463682
IN5	0.351137	0.27664	1.269293	IN5	-0.18934	0.298718	0.633831
IN6	0.245826	0.267262	0.919792	IN6	-0.21067	0.300096	0.70201
IN7	0.34882	0.28397	1.228367	IN7	-0.04151	0.319803	0.129813
IN8	0.251141	0.288953	0.869141	IN8	0.110275	0.313089	0.352215
MT	0.339271	0.292983	1.157989	MT	-0.43	0.2867	1.499838
FT	0.309229	0.290867	1.06313	FT	-0.0805	0.282082	0.285364
F5	0.624104	0.238094	2.621253**	F5	-0.16212	0.232416	0.697556
F6_12	0.309458	0.208186	1.486449	F6_12	-0.01614	0.210802	0.076585
AM	0.213989	0.169968	1.258993	AM	-0.23865	0.161163	1.480827
HOS	-0.04409	0.039848	1.106558	HOS	0.013761	0.038334	0.358971
RAC	0.624489	0.229121	2.725586**	RAC	-0.17596	0.230569	0.76315
LSICP	-0.01584	0.03722	0.425699	LSICP			
LSICN	-0.0825	0.029765	2.771616**	LSICN			
LSYCA	-0.0094	0.04234	0.22202	LSYCA			
AAI8	-3.8E-05	0.000833	0.045046	AAI8			
AAI9	0.001249	0.000655	1.905924	AAI9			
AAI10	0.00085	0.00095	0.895007	AAI10			

** statistically significant difference at the 0.10 level.

Table 7.f: Comparison of estimated parameters over the sample time frame 1976 - 1982
Frequency of use for: CFIM

	b88-b82	Std Err	Asymt-T		b82-b76	Std Err	Asymt-T
ALPHA1	0.626969	0.997043	0.628828	ALPHA1	-1.25106	0.781177	1.601509
ALPHA2	0.730944	0.998362	0.732143	ALPHA2	-1.61886	0.782449	2.068967**
ALPHA3	0.998491	1.013183	0.985499	ALPHA3	-1.61368	0.799919	2.017308**
AGEP	-0.00023	0.020548	0.010987	AGEP	0.006699	0.015221	0.440119
IN1	-0.09198	0.284965	0.322768	IN1	-0.22976	0.343912	0.668073
IN2	-0.25244	0.272729	0.925617	IN2	0.16442	0.28961	0.567728
IN3	-0.06372	0.268696	0.237136	IN3	0.007834	0.293572	0.026685
IN4	0.016527	0.267082	0.061881	IN4	0.094851	0.292521	0.324254
IN5	-0.08066	0.276908	0.291297	IN5	0.052425	0.290931	0.180198
IN6	-0.00662	0.268306	0.024656	IN6	-0.08626	0.292746	0.294664
IN7	-0.09915	0.285468	0.347326	IN7	0.38467	0.312564	1.230692
IN8	-0.02635	0.2933	0.08983	IN8	0.05379	0.309655	0.173709
MT	0.01156	0.294811	0.03921	MT	-0.05262	0.281052	0.187232
FT	-0.01128	0.29221	0.038613	FT	0.241978	0.277234	0.872829
F5	0.095394	0.239016	0.39911	F5	0.125029	0.229256	0.545367
F6_12	-0.00399	0.210312	0.018968	F6_12	0.179603	0.208968	0.859477
AM	-0.08116	0.171942	0.472017	AM	0.136673	0.159841	0.855057
HOS	0.028865	0.039541	0.730018	HOS	-0.05071	0.037526	1.351394
RAC	0.17484	0.233255	0.749566	RAC	-0.23586	0.230552	1.023037
LSICP	-0.00075	0.037643	0.019914	LSICP			
LSICN	-0.01494	0.029616	0.504529	LSICN			
LSYCA	-0.04471	0.042398	1.054537	LSYCA			
AAI8	-0.00054	0.000842	0.642352	AAI8			
AAI9	0.000201	0.000652	0.307342	AAI9			
AAI10	0.000992	0.000946	1.048435	AAI10			

** statistically significant difference at the 0.10 level.